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ROYAL COMMISSION ON MATTERS OF HEALTH AND SAFETY  
ARISING FROM THE USE OF ASBESTOS IN ONTARIO

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Injured Workers Consultants

Mr. T. Lederer

Government of Ontario

180 Dundas Street  
Toronto, Ontario  
Monday,  
June 21, 1982  
9:00 a.m. Session

VOLUME 42 A







ROYAL COMMISSION ON MATTERS OF HEALTH AND SAFETY

ARISING FROM THE USE OF ASBESTOS IN ONTARIO

VOLUME 42 A


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THE FURTHER PROCEEDINGS IN THIS INQUIRY  
RESUMED PURSUANT TO ADJOURNMENT

APPEARANCES AS HERETOFORE NOTED

DR. DUPRE: Good morning, ladies and gentlemen.  
This morning the Commission welcomes Dr. Gyan Rajhans, the  
chief of the occupational health hygiene service in the  
occupational health branch of the Ministry of Labour.

Dr. Rajhans appeared before us previously, but  
this is the first time you are giving formal testimony, so may  
I ask, Dr. Rajhans, please, that you come forward and be sworn  
at this time?

MR. GYAN S. RAJHANS, SWORN

EXAMINATION-IN-CHIEF BY MR. LASKIN

DR. DUPRE: Counsel, are you ready to proceed,  
please?

MR. LASKIN: Thank you, Mr. Chairman.

MR. LASKIN: Q. Is it Dr. or Mr. Rajhans?

THE WITNESS: A. Mister.

Q. Mr. Rajhans, can I just trace with you





5 Q. (cont'd.) briefly your educational background and qualifications, and I think we might shorten it if I could just take you to the first paper in that green book you have in front of you...and the first page of it.

Can I just ask you, is the short biographical sketch that is contained there accurate, at least up to the point of time of publication?

A. Yes.

10 Q. I take it, then, that you joined the Ministry of Labour in 1968, as a dust specialist?

A. Yes.

Q. And remained in that position for how long?

A. Until 1977.

15 Q. What then happened in 1977?

A. In 1977, I got promoted to the position of chief, occupational health hygiene service, the position I am holding now.

Q. The hygiene service, I take it, is a part of the occupational health branch?

20 A. Yes.

Q. Now, before we get into questioning pertaining to you particularly, you did, at my request I believe, compile for us a schedule which sets out the guidelines and applicable exposure limits to the control of asbestos in Ontario?

A. Yes.

25 Q. Going back in time, did you not?

A. Yes, I did.

Q. That's some information we have been trying to procure in one place for some time, and I wonder if you might show that to us, and I gather you have an overhead projection which will demonstrate that?

30 A. Yes, I can. Would you like me to go there





A. (cont'd.) and point out and explain things?

Q. Yes, we would be grateful if you would.

5 A. As you can see in this slide, I have gone as far back as 1946. Now, the slide could be somewhat confusing to those who have not followed the change in the technology as far as sampling is concerned, as regards some of the abbreviations used here. But if you bear with me, I will try to translate these abbreviations as well as explain where the technique got  
10 changed.

MPPCF means million particles per cubic foot - now, that's in the British system - and ACGIH is American Conference of Governmental Industrial Hygienists.

15 So as it indicates, this body came up with this guideline away back in 1946, based on a technique called Greenberg/Smith impinger - Greenberg/Smith impinger. Greenberg and Smith are what they call inventors. They decided to put their names on it.

20 Now, that guideline was adopted by British Occupational Hygiene Society in 1960, so they just took the same number, same technique and simply put it in their own booklet.

In 1968, the ACGIH issued a bulletin that the guideline be dropped from five to two, still using the same technique...and TWA is time-weighted average there.

25 However, they also indicated in that that five MPPCF should be considered as a ceiling - that is, for fifteen minutes five million particles per cubic foot could be attained, but anything over five after fifteen minutes should not be allowed. That was the first time that they came up with the concept of a ceiling exposure for asbestos.

30 Now, suddenly the following year they decided to change the technique of sampling, and suggested a number which, if you just compare the number, appears to be higher - which is



THE WITNESS: (cont'd.) very uncommon, but as I indicated, they changed the technique from Greenberg/Smith impinger. The technique was changed to the so-called membrane filter technique, which is still being used.

The unit got converted to the metric system as fibers per cubic centimeter of air.

In 1970, the British Occupational Hygiene Society suggested, again I would like to emphasize the word suggested - these are all suggestions - that perhaps that is too high and they would like to consider two fibers per cc.

This was predicated on the fact that they had a study in hand in a textile factory which suggested that one hundred fibers years per cc will produce...this is an accumulated exposure...less than one percent incidence of asbestosis, or earliest sign of asbestosis. We can go into detail, but I don't think time and place permit that. If it is required, I would.

So one hundred fiber years per cc, then, got translated into two fibers per cc because they thought the maximum duration of exposure will be about fifty years, so it was a straight equation, dividing one hundred by fifty, which gave two fibers per cc.

Again, as can be seen, in 1970 an intended change by the ACGIH was five fibers per cc, so they went slightly...one half or below one half of the originally-suggested value.

In 1972, the National Institute of Occupational Safety and Health in the States suggested that...or came up with a criteria document which indicated that two fibers per cc is more logically standard than five fibers per cc, and this is again well-documented.

Ontario, at the same time, reading NIOSH and reading other world literature, decided that two fibers per cc should also be our own criteria or guideline.





5 MR. LASKIN: Q. Can you just...stopping there...  
can you just help us as to what was Ontario's guideline in the  
years prior to 1972? Was it following those particular numbers  
that you set out?

THE WITNESS: A. Thank you very much. I neglected  
to mention that.

10 Yes, very correctly. We followed ACGIH.  
Traditionally we have followed them, so we followed ACGIH until  
that time, when we differed from ACGIH and lowered the value  
unilaterally.

Q. And did we follow ACGIH in the year in which  
ACGIH promulgated a particular suggestion or guideline?

A. To the best of my knowledge, we did.

15 Q. So that between 1946 and 1968, the guideline  
in Ontario would have been five million particles per cubic foot?

A. Yes.

Q. And then lowered to two in 1968?

A. That's right. And in 19...

Q. 1969, twelve fibers per cc?

20 A. Yes. And then it continued. As soon as  
they went to five, we went to five, but we didn't stay at five,  
as you can see, for more than two years...or less than two  
years we stayed, and we dropped it to two fibers per cc.

Okay?

25 Q. Do you have any knowledge as to the reason  
why Ontario, in 1972, departed from its reliance upon the ACGIH?

A. Yes, I do, because I was involved in it, and  
the reason we did is that it was becoming quite clear, reading  
the NIOSH document and reading other documents, that there is  
a reason for dropping the value and divorcing ourselves, at  
least in this case, from the ACGIH list.

30 Okay?





5 A. (cont'd.) Then from there on, all I have done is shown to you what is happening in the rest of the world. As you all know, there is a proposal at this time by the Ontario Government, designating asbestos and the standards mentioned in that proposal. So really, all I have done is, by this chart, showing you what is happening in the rest of the world. We are reviewing their documentation very closely, and that process is an ongoing process.

10 DR. UFFEN: A quick question. You have mentioned the different measurement techniques. When you get beyond 1976, are these still membrane filter methods?

THE WITNESS: Yes. Thank you very much. Yes. This is still the same method which is being advocated.

15 DR. DUPRE: One other question while I'm looking at your chart, Mr. Rajhans, from my limited knowledge, none of the values that are shown here are actually embodied in regulations, either on the part of OSHA or of NIOSH - that is to say the point five and the point one. The exposure ceiling remains two in the United States, is that correct?

20 THE WITNESS: I think you are correct, as far as my knowledge is concerned. Yes, none of them, the lower values that is, have been enacted anywhere that I know of.

Again, I would like to qualify myself - I am not that familiar with Sweden and other European countries.

DR. DUPRE: That is the possible exception?

25 THE WITNESS: Yes.

DR. DUPRE: One other question, if I may be permitted. As you mentioned, you were present when the two fiber guideline was adopted in Ontario. Was there consultation with either industry or labour in the adoption of this guideline, or was it done simply by the ministry acting unilaterally?

30 THE WITNESS: I think we acted unilaterally.



DR. DUPRE: And you were acting at that time pursuant to legislation?

5 THE WITNESS: Sorry...?

DR. DUPRE: Under what legislation were you acting to adopt...

THE WITNESS: Oh, the legislation was Industrial Safety Regulations, 1971...1964, perhaps, amended in 1971, but we were working mostly under the Industrial Safety Regulations.

10 MR. LASKIN: Q. Pursuant to the Industrial Health and Safety Act?

THE WITNESS: A. There was no Industrial Health and Safety Act there at that time.

Q. Industrial Safety Act, I'm sorry.

15 A. Industrial Safety Act, sorry. Yes, you are right. Sorry. Industrial Safety Act.

DR. DUPRE: The Industrial Safety Act, likewise, provided the legislative or statutory underpinning going all the way back to the 1946 five million particles per cubic foot?

20 THE WITNESS: Yes. I think, if my recollection is right, there was always some piece of legislation under which we could issue corrective orders, using these guidelines.

Okay?

MR. LASKIN: Yes, thanks, Mr. Rajhans.

25 MR. LASKIN: Q. Just one further question...and none of us has either that statute or the regulation in front of us...but can you recall what the mandate was under the regulation or the statute in terms of the control of a substance such as asbestos? Was it to...

30 THE WITNESS: A. Again, I have to go by my memory. I don't have the exact wording with me, so you just have to forgive me on that, but I think the wordings were that all necessary measures shall be taken where there is a hazard





5 A. (cnt'd.) due to previous contaminants, and examples were given and asbestos was highlighted, along with benzene, mercury and other stuff.

Q. All right. Thanks very much, Mr. Rajhans.

10 Can we return more specifically to your duties and responsibilities with the ministry, and can I take you back to the period, briefly, between 1968 and 1977, when you were a dust specialist, and ask you what your duties were, what your responsibilities were, more specifically?

15 A. My responsibilities were mainly to investigate plants or any industry where dust exposure, mainly due to silica and asbestos, could be present, and write detailed technical investigative reports, and also suggest any followup. Along with those routine duties I also helped to locate some of the areas, some of the plants, that may have some potential exposure due to asbestos and silica, but had not got the same attention.

20 So those were the main things that I was involved in. In due course, you know, in that period, I also became knowledgeable in ventilation, industrial ventilation, and did a lot of work on industrial ventilation and research on industrial ventilation, as well as dust-control measures, subsequently published a few papers.

25 Q. All right. Did you compile a list of those establishments where there was asbestos exposure or where there were asbestos operations being carried on?

30 A. Yes, I did. I shouldn't say I did it singlehandedly, but I helped to compile those, including some silica exposures.

Q. Okay. And then was your responsibility to go out to those particular operations?

30 A. Yes.

Q. Were you giving them any actual advice as to their control systems, as to their ventilation systems?



A. Yes.

5 Q. Were you going so far as to suggest the design of systems for them?

A. At that time, I think we did. I think all of us did. I believe we helped the companies as much as possible.

Q. Did that include the larger concerns as well as the smaller concerns?

10 A. I don't know exactly what you mean by larger here. I would say, again I'm going by my memory and as you grow old memory doesn't remain with you as accurate as possible... I would say yes, we didn't really discriminate, if that's what you mean. Whoever asked our advice, and if we had the expertise we gave it to them.

15 DR. DUPRE: Could you try and speak a little louder, please, Mr. Rajhans? The reporter is having a hard time picking you up.

THE WITNESS: Oh, I'm sorry.

Should I repeat?

20 MR. LASKIN: No, no. Unless...

THE REPORTER: That's fine. Thank you, Mr. Chairman.

25 MR. LASKIN: Q. Can you tell me this, because I take it roughly between...well, between 1968 and 1977, when you were a dust specialist, clearly were in the era prior to the passage of Bill 70...and can I ask you from your experience and from your dealings with asbestos-manufacturing establishments in particular, what was the philosophy of the ministry in terms of your role and the role of your branch in dealing with these establishments?

30 THE WITNESS: A. The philosophy I don't think had changed, has remained the same, to protect the workers' health.

Q. Was the ministry pursuing an activist role





Q. (cont'd.) in terms of the kinds of recommendations it was giving to firms?

5 A. I don't think I can tell you that the ministry was following...it will be difficult for me to talk on behalf of the entire ministry. Our role in the branch at that time, which was environmental health services branch - subsequently it became occupational health protection branch, now occupational health branch - has always been to see that the corrective measures are  
10 installed and imminent health hazard is eliminated.

I think we did more persuasion and education and co-operation, because we had all the time in the world, perhaps, at that time, but yes...and the knowledge wasn't available as much as it is now. Now, with the knowledge and awareness, it has become much easier, but at that time we  
15 were educating them, we were persuading them, we were, where needed, we were very strict and if needed, we gave a time limit and got the things corrected.

But first, we wanted to educate them and see that they understand what we are trying to do.

20 DR. DUPRE: Can I pursue this for a moment, counsel?

MR. LASKIN: Mmm-hmm.

DR. DUPRE: Mr. Rajhans, the current philosophy of the ministry has been articulated in a number of places. It's described in Professor Bruce Doren, in the study that he has done for this Commission, with which you may be familiar...are  
25 you familiar with that study?

THE WITNESS: I have glanced through it.

DR. DUPRE: By the way, do you take his characterization of the ministry and its philosophy, as it involves the joint responsibility system, as a fair characterization?

30 THE WITNESS: I'm sorry. I must say that I do not recall totally or accurately what he said there. So I think



THE WITNESS: (cont'd.) it would not be fair to comment on it as it is.

5 DR. DUPRE: Okay. Well, let me simply put the following to you: Is it fair to characterize the current philosophy of the ministry as very much grounded in the internal responsibility system that Dr. Ham advocated in his report that is in many ways the foundation stone of the current Act?

THE WITNESS: Yes.

10 DR. DUPRE: And that the ministry views its role in the promotion of occupational health as one of promoting the operation of the joint committees, and stepping in to enforce matters only at the point where the joint committee system is failing to function? Is that a kind of fair, general characterization?

15 THE WITNESS: The general characterization, you are correct that we are trying to promote the activities of the joint safety committee, as well as internal responsibility system.

20 However, I do not want to leave you with the impression that the ministry is sitting on the sideline and waiting until something completely goes haywire and then step in. We do have our own system of followup.

DR. DUPRE: Okay. Well, let's take it that that also squares with my understanding at the moment, of the ministry's approach.

25 Now, could I ask you this - prior to 1978, the internal responsibility system was not articulated as a philosophy, as I understand it, the way it is at the present time. But joint health and safety committees were, as a practical matter, not uncommon. Is that correct?

30 THE WITNESS: I don't know if I can say accurately anything on it. I was aware of few joint health and safety committees, let me put it this way...

DR. DUPRE: Okay.





THE WITNESS: ...but I can't say that they were common.

5 DR. DUPRE: So now to zero in on the particular industry of which you...in which you have been involved in dust control, were joint health and safety committees present in most of the firms with which...most of the asbestos firms with which you were dealing?

THE WITNESS: No, I don't think you can most, no.

10 DR. DUPRE: In particular, was there such a committee at the Johns-Manville plant in Scarborough?

THE WITNESS: I do not remember anything of that sort. However, all I remember is that everytime we had any discussion at the plant, one of the union members was present. I must admit I didn't go too deep into finding out whether it was due to the committee or due to their own...

15 DR. DUPRE: Mr. Rajhans, I'm trying to wrap my arms around the way the system is working now, as opposed to the way the system was working then...now being since 1978, and then being before 1978.

20 Would it be...or could I ask you this question: Is it likely that now...that is to say since 1978...you would, or the staff immediately you would, be quite familiar with the existence and operations of joint safety committees as opposed to the obviously more-sketchy role that they must have played since your pre-1978 recollections are spotty?

25 THE WITNESS: Yes, I...

DR. DUPRE: Would that be a fair characterization?

THE WITNESS: Yes. I would say that they would definitely try or attempt during each visit to find out from the company if there is. This has become more common with the advent of our Designated Substance Regulation, which requires this.

30 DR. DUPRE: Now, of course, the advent or otherwise



DR. DUPRE: (cont'd.) of the Designated Substance Regulation does not affect the operation of joint committees under the statute, as I understand it, except in firms with fewer than twenty employees, is that correct?

THE WITNESS: That's correct. That is, if the designated substance is present.

DR. DUPRE: So that whether or not a substance is officially signed, sealed and delivered as designated, your branch would continue to be concerned about dust levels in, for example, various asbestos plants?

THE WITNESS: Yes. I would say.

DR. DUPRE: All right.

Sorry, counsel.

MR. LASKIN: No, that's fine. You did it much more directly.

MR. LASKIN: Q. I, also, was trying to get at, Mr. Rajhans, what role and responsibilities your branch was playing in the pre-1978 era, as opposed to now.

Can I ask you, as a result of the enactment of the Occupational Health and Safety Act in 1978, did that increase your branch's workload in the sense that it opened up a large number of additional establishments or workplaces that were then under your responsibility?

THE WITNESS: A. Yes. It brought more workers.

Q. Can you give me any estimate of that?

A. No. I haven't sat down and done any estimation, but it definitely increased the workload.

Q. All right. With the increase in the workload, did that carry with it any...with the increase in the workload and with the establishment of the joint responsibility, internal responsibility system - at least under statute, did that carry with it a change in the role that your branch played?





5 A. The role really hasn't changed, but some of the directives to the field staff have changed in the sense that they should ask more questions and meet with more people and involve the union people, involve the health and safety rep. I don't think the basic role has changed.

Q. Let me ask you a few specific questions on specific areas. Let's take the question of sampling at the workplace.

10 Who was doing sampling at, for example, asbestos establishments prior to 1978?

A. The sampling was carried out by the sampling technicians. We used to call them air quality assessment technicians.

15 Q. Within the ministry?

A. Within the ministry.

Q. All right.

20 A. Prior to 1978...in fact, you can go prior to oh, 1975 or 1974...the technicians were part of the occupational health lab, and we will send our request to them and they will do the sampling, and invariably we will go out with them in order to pinpoint the areas that we want sampling to be done.

In 1975, and I stand corrected of the date here, the technicians were made part of the hygiene service in that they started working with the hygienists and engineers, together.

25 Also, we increased the work force of technicians, so what it really translated into, as far as you are concerned - think that's, perhaps, what you want to know - is that we started more long-term samplings than we did in the past, and the philosophy of more longer-term samplings continued after 1978, with the advent of the Act and Regulations, where compliance could be one of the things that we should look into.

30 Q. But did you, in the post-1978 era, did you



Q. (cont'd.) not also rely more upon companies doing their own sampling? Didn't the ministry then expect that companies would do their own sampling, and that you would perform an audit or monitoring function?

A. In all honesty, I must say that this is what the philosophy is and was. However, as you can appreciate, the changeover, you know, takes time, so I would say that yes, we are trying to encourage that, but we have continued monitoring and sampling in the same way, but slowly, yes, we are trying to tell them it is their responsibility, they have to do it - sooner or later they have to realize this fact.

Q. And your role, as you contemplate it, I take it, will be to do a check on them, a monitor on them, from time to time?

A. Audit. We call it audit.

Q. Audit?

A. Yes.

Q. And that audit, I take it, will what, involve parallel sampling?

A. Yes, it could involve parallel sampling if the circumstances warrant, or it could also involve split sampling, sampling, you know, splitting the same sample. But sometimes it could just involve looking at the book and see if there is something which does not look very good, and then go and follow up the sampling.

Q. All right. You also said you are now engaged more in doing long-term sampling, and do I take it by that you mean you are now engaged in doing, say, sampling over five or six hours, as opposed to the kind of fifteen minute to forty-five minute sampling that was done previously?

A. Yes. Gradually it has increased in the duration.



Q. Just briefly, what's the reason for that?

A. More accuracies, perhaps, lowered standards, I think lowered standard is the main thing behind it. As I indicated to you, when the standards were very, you know, like numbers were high, even fifteen, twenty minute sample gave us the indication what's going to happen. But as the standard drops, the sampling and analytical technique, both, have to be improved, and one thing that you can improve on sampling is the duration - longer term gives you more accurate results, and better averages.

Q. Did you have a substantial role to play in the code for measuring airborne asbestos fibers under the proposed new regulations?

A. Which one?

Q. Which regulation?

A. Yes.

Q. Well, let's take the latest one on the books, the one at September, 1981.

A. Oh, the asbestos...

DR. DUPRE: Perhaps, counsel, before we delve into the regulation, I wonder if I could just pursue the line of questioning that you just seem to have completed, with respect to the sampling of air quality.

Mr. Rajhans, I would like to perhaps help the two of us in terms of our exchange of information, if we zero in on a particular plant. I refer to the J-M plant in Scarborough, and I refer to that plant properly, I think, not least because, of course, it is the subject of a major, international paper by your colleague, Dr. Finkelstein, which, of course, places on the record, but of course historically, the estimation of dust levels posed an extremely difficult problem for him.

Now, I take it that, of course, your experience





DR. DUPRE: (cont'd.) only dates from 1968. Could I perhaps ask you this: In let us say your early years with the ministry...and I will take as your early years between 1968 and 1972...a four year period during which, according to your chart, we have the Greenberg/Smith impinger method with a guideline of five million parts per cubic foot.

May I ask the extent to which the ministry itself, in this four period, was actively involved in collecting air samples, as distinct from receiving such air samples as were collected in the plant?

THE WITNESS: Yes. We were.

DR. DUPRE: You were taking your own air samples?

THE WITNESS: Yes.

MR. LEDERER: Mr. Chairman...

MR. LASKIN: Q. You were with the Ministry of Health then, is that right?

THE WITNESS: A. That's right, sorry.

Q. Just to clarify that.

DR. DUPRE: Right.

MR. LASKIN: Q. You didn't come into the Ministry of Labour until...

THE WITNESS: A. Exactly. Until 1976, I think. I'm sorry, I should...

DR. DUPRE: My question, indeed, should be couched in terms of your branch.

Mr. Lederer, was that...

MR. LEDERER: That was precisely the point, Mr. Chairman. Both you and Mr. Laskin having referred to 'the ministry', I simply wanted to clarify that 'the ministry' changed at a certain point in time.

DR. DUPRE: Yes. Let me just state for the record that we will accept all the questions of that vein as having



5 DR. DUPRE: (cont'd.) involved what the role of the branch that was involved in dust control and air monitoring was, whatever the particular ministry in which it may have been located.

MR. LEDERER: Thank you, sir.

DR. DUPRE: Okay? I think the record will show that.

10 So then, from the time you joined the ministry until 1972, the ministry was collecting air samples of its own from that time?

15 THE WITNESS: Yes, and I should also say that the company was doing its own sampling as well, and they were sending their sampling results to us for comment and record keeping, if we have any.

DR. DUPRE: Were they doing so voluntarily, or had you directed them to do so?

THE WITNESS: I'm sorry. I can't answer that. What happened, I don't have the recollection.

20 DR. DUPRE: But to the best of your knowledge, you were getting a regular inflow of information?

THE WITNESS: Yes.

DR. DUPRE: From the company, with which you compared your own data?

THE WITNESS: Exactly.

25 DR. DUPRE: Now, if we take, if I may, the period from 1972 on, beginning in 1972, of course, you have changed to a different guideline, a two fiber guideline, and of course you, from this point on, are using the membrane filter method.

30 Was there...however obviously we put the technique... was there a change in the frequency with which the ministry took its own samples, or the extent to which the ministry relied upon samples from the company?





5 THE WITNESS: No, I don't think the frequency really changed at all. What you have to realize is that the technique, the membrane filter technique, was adopted by us in 1969. However, we had not perfected the technique and we experimented with the parallel sampling of the technique with the Greenberg/Smith impinger, because that's what the standard was based on, just to see that we are going to get some kind of correlation which in the future might be helpful.

10 So...

15 DR. DUPRE: Just to make sure I understand that, is it fair to say that between 1969 and 1972, you...and this was on your road to the membrane filter technique...the ministry conducted parallel measurements - some using the Greenberg/Smith impinger, others using the membrane filter?

THE WITNESS: In some cases we did.

20 DR. DUPRE: Was the firm, the company, at that time itself using parallel techniques and sharing both with you, or had they already graduated to the membrane filter method?

25 THE WITNESS: To the best of my knowledge, they also continued on the same path for awhile, before they adopted the thing, because I recall getting the results from the company in both units and in both techniques.

30 DR. DUPRE: But then is it fair to say that from 1972 on, both your measurements and those taken by the company rely entirely on the membrane filter...

THE WITNESS: Yes.

DR. DUPRE: ...method?

THE WITNESS: Yes.

35 DR. DUPRE: So from 1972, until we get the new legislation in 1978, I can take it that basically the ministry was, on a regular basis, monitoring the air in that plant through the membrane filter technique, and was also monitoring the air in that plant by reviewing the readings that the company shared



DR. DUPRE: (cont'd.) with the ministry?

THE WITNESS: Yes.

5 DR. DUPRE: Might I ask if, in your observations, there is any change in the frequency with which samples were being taken by the ministry over this period of time?

THE WITNESS: I'm trying to recall, Mr. Chairman, whether we changed the frequencies. I think if you average them over the number of years, you will find the frequencies really  
10 didn't change that much.

However, what has happened in various plants that several reasons have precipitated which had prompted us to go back to the company in that particular year more often than in the previous year. As I stated, if you averaged all these out, you would find the frequencies really did not change, and...sorry?  
15

DR. DUPRE: And what is that particular year? You said, 'in that particular year'. Is that 1972, 1978 or was it a year...?

THE WITNESS: No, no. What I really meant was that it could be that in any plant...  
20

DR. DUPRE: In any given plant?

THE WITNESS: In any given plant, in a particular year, the frequencies might have changed due to various reasons.

DR. DUPRE: Okay.

Now, in the particular case of J-M, you don't recall what the frequencies may have been?  
25

THE WITNESS: No, I do not recall offhand.

DR. DUPRE: Now, may I ask one final question in this line, if you permit, counsel.

1978 brings the Act, and of course, 1979, roughly, embraces the time period of implementation, and of course as I understand it, that plant gets out of the A-C pipe business  
30



DR. DUPRE: (cont'd.) a year or so later.

But in the brief period in which A-C pipe manufacturing continued in that plant, and the new regime was in force under the new Act, do you recall any particular change in either the frequency at which measurements were taken, or of the extent to which such measurements as were taken may or may not have been shared with the joint labour/management committee, which of course was mandated by law from 1979 on?

THE WITNESS: As to the frequencies, I do not recall any change between 1978 and 1979. As to the activities of joint health and safety committees, I'm sorry, I'm at a disadvantageous position to say anything on it.

DR. DUPRE: Presumably the reason for that, Mr. Rajhans, would be that as chief of the occupational health hygiene service, your particular service does not have the kind of contact with these committees that the inspectional branch of the ministry would have, the industrial safety branch? Is that the reason why you would not have particular knowledge?

THE WITNESS: I guess in all fairness you can say, yes, the inspection branch has more contact because they visit the companies more regularly than we do.

DR. DUPRE: Thank you.

Counsel?

DR. UFFEN: Can I have a quick question, just about the...

MR. LASKIN: By all means.

DR. UFFEN: This particular plant, the Scarborough plant, it's closed now, is it?

THE WITNESS: A-C, asbestos-cement pipe manufacturing is closed.

DR. UFFEN: Is the equipment still there, that was used to make the pipe?





THE WITNESS: I think the equipment got transported last year, or the last six months or so, to a Quebec plant...or somewhere, I'm sorry. I'm sorry. But it did get transported.

DR. UFFEN: Did you or your staff monitor the plant while they took...

THE WITNESS: Yes, while it was being dismantled and while being taken out of the plant, we did, and we were very closely in touch with the contractor and the plant, and we also informed Transport Canada and everybody else.

DR. UFFEN: Are the figures available for the dust levels during that exercise?

THE WITNESS: They should be available. They should be available, yes.

DR. DUPRE: Counsel, if you are going to get into the new standard, I think I have another question.

MR. LASKIN: I had a couple of questions just on that particular plant.

DR. DUPRE: Then please proceed. I'll...

MR. LASKIN: No, you carry on.

MR. LASKIN: Q. Just dealing with that plant just for a moment again, in looking through your publications, there was a paragraph that struck me, in tab five at page seven, which related to crocidolite. This is your review of asbestos exposures in Ontario, which you gave at a seminar in 1977.

THE WITNESS: A. Oh, okay. Page seven?

Q. Yes.

A. Yes.

Q. If we just look at the second-last paragraph on page seven, you there indicate that we never had...

"Although we never had a separate TLV for crocidolite, we discouraged its use whenever we found it".



Q. (cont'd.) Then you go on to say that,  
"In 1975, the Ministry of Health adopted a  
standard for blue asbestos, crocidolite, of  
zero point two fibers per cc."

A. Yes, that's correct.

Q. Now, of course, the J-M plant at Scarborough...  
at least it's our information...used crocidolite in the making  
of A-C pipe?

A. Yes.

Q. I'm just wondering the extent to which the  
sentiments you express in that paragraph, on the one hand, or  
the Ministry of Health suggestion on the other hand, were ever  
applied to the transite pipe section of the J-M plant at  
Scarborough?

A. I think that we always...you will find there  
is correspondence to that effect, and we made the company aware  
of the international thinking on blue asbestos. I must also  
indicate that that particular view was not shared, you know,  
universally, but yes, we kept the companies abreast...and as  
a matter of fact, the company, I must commend the company in  
that respect, that they were aware of these things, what was  
going on internationally, before we could make them aware.

Q. Was the Ministry of Health standard of point  
two that you refer to there, was that in any way applied within  
the workplace?

A. I think one correction, perhaps, should have  
been made there. It was never a standard. It was...

Q. It was a suggestion.

A. ...I think it was still a guideline. I think  
that's, perhaps, semantics there, but we have interchangeably  
used those words without realizing the legal implication.

I would say that yes, anywhere we found crocidolite





5 A. (cont'd.) we said that this is what our guideline is and would require much more restrictive control measures than chrysotile, or white asbestos.

Q. Do you have any information here today with you today as to...

DR. DUPRE: Sorry, counsel. I just wanted to pick up on that very word, the very words that the witness used.

10 As I understood it, Mr. Rajhans, you said, "If crocidolite was being used, we made sure that our guideline was being applied"?

THE WITNESS: Yeah. We made sure that they know about our guideline.

15 DR. DUPRE: You made sure that they knew about the guideline.

Now, the guideline about which you were making sure was what guideline, the two fiber, or before that the five million particles?

THE WITNESS: Are we talking about crocidolite now?

20 DR. DUPRE: Yes, yes. Or was there a separate guideline for crocidolite?

THE WITNESS: As I say in that paper there, Mr. Chairman, in 1975...

DR. DUPRE: In 1975.

25 THE WITNESS: ...in 1975, we adopted, for crocidolite, a guideline...or blue asbestos...of zero point two fibers per cc.

DR. DUPRE: Okay. That's what I wanted to make sure I had on the record.

30 So that as of 1975, you were making sure that any firm that used crocidolite was aware of this new guideline?

THE WITNESS: Of this restrictive...yes.



DR. DUPRE: Prior to that, of course, there was no guideline differentiating by fiber type?

THE WITNESS: That's right.

DR. DUPRE: Okay. I just wanted to get that clear in my own mind, counsel.

MR. LASKIN: Q. But were you, was the ministry or was your branch in fact giving notice to firms that were using crocidolite post-1975, that they had to bring their levels down to point two, if they were working with, say, chrysotile and crocidolite?

THE WITNESS: A. There was really no mechanism for sending notices, except the route that we always took, and that was when we wrote a report on that company, in that report we mentioned that this is the guideline we are working, so you have these options. One of the options was air supply helmet or something of that nature, which would reduce the exposure to below that level.

I do not recall sending particular notices to all the companies.

Q. Do you have any information here with you today as to what the dust levels were at that plant in Scarborough, over time?

A. I have a charge, Mr. Counsellor, that can be looked at. I don't think that will give you the details, but it will give you the averages that the company kept.

Q. Can we see it?

A. Yes. I can get it. It's a slide, so I can just...

MR. LASKIN: It's backwards.

THE WITNESS: Is this all right?

MR. LASKIN: Can you lift it?

THE WITNESS: Yes. Well, that should be all right.



THE WITNESS: (cont'd.) I think the pertinent information should be there.

MISS JOLLEY: Can you focus it?

MR. LASKIN: Q. Can you tell us what we are looking at there?

THE WITNESS: A. Oh, we are looking at a Johns-Manville...Canadian Johns-Manville, I should say...the dust levels in the years from 1948 to 1978.

DR. UFFEN: What does the GS stand for in GS dust counts?

THE WITNESS: It's not GS Rajhans. It's the Greenberg/Smith impinger.

DR. UFFEN: Right.

THE WITNESS: Thank you.

Now, if I can again explain that it could be a little bit confusing here. As I indicated in the previous slide, until 19...you say about 1969...the technique used was Greenberg/Smith impinger, and the counts were recorded in million particles per cubic foot. So it dropped then, it went up a bit, it dropped quite a bit, now from here on, the unit got changed and the technique got changed, which is listed in this Y axis, and which is in terms of fibers per cubic centimeter.

So although it may look that it went up a lot, really not. Because this part should be compared separately, and this part should be compared separately.

As you will see, that beginning 1969 onwards, when they started reporting in fibers per cc and we also adopted our membrane filter technique, consequently it had gone down.

Now, this slide also shows various standards... again, guidelines, TLV's, you've got to pardon me on that...had changed. Okay?

Q. Okay. The data that are reflected in that





Q. (cont'd.) chart, are they Ministry of Labour data or are they company data?

5 A. It is our own data. Let me qualify. I think most...ninety percent are our own data, but I couldn't really be very sure...we might have included some of their data, but most of the data are our own.

Q. Did you prepare this particular chart, Mr. Rajhans?

10 A. Yes. When I say...I think we prepared in co-operation with the technicians and the help of the technicians at that time.

Q. Is all of that data collected in...the data that is reflected on that chart, is it all collected in one place?

15 A. It should be available somewhere.

Q. But, the actual...in other words, the actual measurements that you used to ...

A. Yes.

Q. ...ultimately produce that chart?

A. Yes, right.

20 DR. UFFEN: Could I just establish on that chart the limits of error? I take it at, for example, the year 1978, you've got the square marking the median and the length of the bar. Is that the probable error?

THE WITNESS: Yes.

DR. UFFEN: The probable error?

25 THE WITNESS: No, no. It's the range, and these are averages.

DR. UFFEN: The white square marks the average?

THE WITNESS: Averages. These are averages and then there are range, where some of the counts went...

30 DR. UFFEN: Over a period of that year, during that year?



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THE WITNESS: That's right. Exactly.

DR. UFFEN: So in that particular case, it might have got up quite close to one fiber per cc at least once during the year...

THE WITNESS: It could, yes. There have been excursions...

DR. UFFEN: ...as I read the chart?

THE WITNESS: Yes, the excursions have been there and we are not trying to hide any excursions here.

DR. UFFEN: No, I just wanted to have a chart like this with more information on it than we've dealt with yet...

THE WITNESS: Yes.

DR. UFFEN: ...just to make sure I knew whether we were talking about probable error or limit.

THE WITNESS: The excursions during that year.

DR. UFFEN: Thanks.

DR. DUPRE: If I can just take it from that, Mr. Rajhans, if I'm looking at that chart it would probably be, on the third-last set of observations, it would probably be 1976 that you last recorded in that plant a maximum excursion of above two fibers, correct?

THE WITNESS: Yes. Three.

MR. LASKIN: Q. For what purpose was this particular chart prepared?

THE WITNESS: A. I guess for our own review, what is going on in the plant.

Q. Can you tell us one way or the other whether the data that went into that chart is the same data that Dr. Finkelstein used in preparing the papers which he earlier presented to this Commission?

A. I can't tell you that, sorry.

Q. But I take it that insofar as you know, the data are available to be inspected if the Commission deems it



Q. (cont'd.) appropriate to inspect them?

A. I suppose so.

MR. LEDERER: If we can find them.

MISS JOLLEY: For all plants? For all plants, not just J-M?

MR. LEDERER: Well, at the moment there is no information that this kind of data has been collected for other plants. I have no idea of what's been done.

There is no evidence here that it has been done for any other plants than J-M, and beyond that I think before we went off on a chase for the information I would like to have some indication that the Commission feels it would be helpful. It would obviously take some time and there would be some expense involved, and I wouldn't like to do it if you didn't think it was going to help you.

DR. DUPRE: We may well inform you in due course.

MR. McCOMBIE: Mr. Chairman, I am wondering...I'm sorry to interrupt...but I'm wondering, seeing as how we have the slide here, if I could just get a couple of clarifications, if Mr. Laskin doesn't mind jumping in...

MR. LASKIN: Sure. Not at all.

MR. McCOMBIE: ..rather than having to show it again.

DR. DUPRE: Can we just see that slide again?

MR. McCOMBIE: Yes, thank you.

DR. UFFEN: And can we have copies of it?

MR. McCOMBIE: The one thing I want to have clarified is the horizontal line indicating TWA 1949 to 1968. Now, you are saying that that is the standards, the guidelines of those times?

THE WITNESS: Okay. Let me explain how these standards were determined, for Canadian Johns-Manville especially.





5 THE WITNESS: (cnt'd.) As I indicated to you, at that time the standard for asbestos was five million particles per cubic foot. But since we were doing impinger counts, impinger under the magnification of one hundred of microscope, when counts, it is very difficult to differentiate between fibers and grains or anything else. So we were counting everything that we saw.

10 Hence, we had to calculate our own TLV, our own time weighted average, based on percentage of asbestos, percentage of cement in it, and percentage of silica in it, because everything was being looked at.

15 There is a method of calculating...it's in the TLV book, that's what we used...and based on that, we came up with the standard of about eight million particles per cubic foot there...if that's what you are wondering about.

This is about four point five or five million particles per cubic foot, and then from there on, when we started counting only asbestos, it was strictly...

MR. McCOMBIE: With the membrane filter?

THE WITNESS: ...fiber per...that's right.

20 MR. McCOMBIE: So in other words, the standard or the guideline of eight, that would assume that for every eight particles per million...million particles per cubic foot...that three of those would be particles other than asbestos fibers, is that roughly the...

25 THE WITNESS: It could be, depending on the amount... I think the percentage was...oh, I'm trying to remember, I may need some help here, but...

MR. McCOMBIE: It was roughly that kind of a supposition you were going under?

30 THE WITNESS: Yeah, okay. So the percentage there is not really thirty-three, thirty-three or something. Percentage was different. Like, it could be forty, twenty, something, you know.



MR. McCOMBIE: The ACGIH, when they set the five million particles standard or guideline, did they not...I mean this was dealing strictly with asbestos fibers, they had some...I'm just curious about the discrepancy here between these two guidelines.

THE WITNESS: When they set it at five million particles per cubic foot, using particular method, they were advocating to count...and that was an arbitrary method or arbitrary guideline or parameters that they used...how you can differentiate on that slide between fibrous grains, if I can call it, and nonfibrous grains, so that an experienced counter could be counting only fibrous grains and hence five will be for asbestos only. It was becoming evident as we went on that it was almost impossible under that magnification to differentiate between various types of dust.

MR. McCOMBIE: So the ACGIH guideline would be stricter in that it would focus only on asbestos fiber, whereas the guideline you were using would have other particles?

THE WITNESS: I don't know which one will be stricter. I think ours will be more restrictive.

MR. McCOMBIE: More accurate, perhaps is a better way to put it.

THE WITNESS: If you can count asbestos only, if that can be established, perhaps they will be more accurate. But I would call it more restrictive.

MR. McCOMBIE: Okay, thank you.

DR. DUPRE: Just before we remove that chart, there is something I want to make sure I understand.

As I understood the early part of your testimony, Ontario followed the ACGIH guideline of five million particles per cubic foot from the time it was enunciated in 1946?

THE WITNESS: Yes.



DR. DUPRE: Okay. So that was the Ontario guideline?

THE WITNESS: That's right.

DR. DUPRE: Now, I can take it then from the readings on that chart, that the guideline was away exceeded in 1948, it was running at about eleven million particles per cubic foot, that you were having measurements of about six million particles in about 1955, and of about seven million particles in about 1961?

THE WITNESS: In 1948, I think, or 1949, in this respect, I think you may be correct in saying what you are saying, because as I just finished explaining, this is the standard which is about eight, our guideline, that was determined for that plant...determined for that plant based on three things in the dust - asbestos, cement and silica - and both had the standards in the same unit, counting by the same technique.

So this was established for that plant. So really, yes. In 1949, they exceeded, but since then continuously or consistently they went down below that.

MR. LASKIN: Q. Are you saying that the ACGIH standard was for asbestos...

THE WITNESS: A. Only.

Q. ...dust, and what you were measuring was dust period, and in order to try and equate the two you used some formula that essentially placed the overall dust level at eight, and that was, I take it, generally to be equivalent to five million particles per cubic foot of asbestos dust?

A. Yes, exactly.

DR. UFFEN: Mr. Rajhans, that would be a fairly reasonable thing to do at the time. But it would seem to me that you might be able to help us here if you could replot that graph and for the period 1969 to about 1972, where you had both





5 DR. UFFEN: (cont'd.) impinger counts and membrane filter methods, plot them together and then there would be an opportunity to seeing the correlation between the two techniques and the equivalence of dust and fiber, or the conversion factor that we heard a lot about in earlier testimony when I think you were present. If you were able to do that for us, just for that chart, it would give us historical records where the commissioners could relate the actual trend over the years.

10 Right now, it's very difficult to figure out what happened in 1968 to 1972, from that particular graph, and I think that would be very important for us.

15 THE WITNESS: I agree with you. Everybody is looking for that conversion factor. Throughout the world they have been trying, and we tried in the same way. Unfortunately, and as everybody else's experience has been, we didn't get very good correlation, so we didn't really follow it up as well as we should have.

However, while there were data maybe available, it will be passed on.

20 DR. UFFEN: You see, this is a particular case of particular interest, an Ontario plant where the two techniques were used simultaneously, which makes it particularly valuable tous.

25 My recollection is that only in Germany and in Quebec do we have available to us the simultaneous measurements by the two techniques.

THE WITNESS: Yes.

DR. UFFEN: We can take this up later, but I think that it would be quite valuable to have that done, even if it does require a little time and effort.

30 MISS JOLLEY: I wonder, I have just two questions...

DR. DUPRE: Carry on, please, Miss Jolley.



MISS JOLLEY: Okay.

5 I have reports written by you about Johns-Manville, from 1974, where you have suggested that in fact Mr. Nelson, Mr. Hugh Nelson, had recommended a fiber level of one fiber per cubic centimeter on May 24th, a memo in 1974, and in a lot of your reports from 1974 on, you recommended that the level was in fact one fiber per cubic centimeter.

10 I wonder if you could clarify that.

THE WITNESS: Oh, I must go and look at the report, because I have to read it, I'm sorry, before I can comment on it. I don't exactly remember what I said.

MISS JOLLEY: I can get copies...

15 THE WITNESS: I'm not saying that you are misquoting me. All I'm saying is that I do not recall exactly what happened.

MISS JOLLEY: No, I just recall in the debate away back in 1974, that there was a lot of controversy about whether it was one or two fibers, and in a couple of the reports which I can make available at the break time.

20 But the other thing I would like to ask is that in fact the Johns-Manville workers worked a forty-eight hour and again, some of your reports suggested the TLV should be lowered to reflect the extra hours worked, and you have it at two fibers and I wondered whether or not it shouldn't reflect a lower level?

25 THE WITNESS: If it can be demonstrated that they are working more than forty hours, there is a very simple formula, as you know, and it can be converted to a lower level. There is no if or but about it, if the exposure is longer.

MISS JOLLEY: Again, your background documents indicate that they did work a forty-eight hour shift.

30 THE WITNESS: I have to look at what I said, Mr. Chairman.



MR. LASKIN: Q. Can I turn, just for a moment, to the proposed new regulation, and can I ask you, Mr. Rajhans, what input, if any, you had in respect of, first of all, the code for respiratory equipment, because I noticed you have written fairly widely on the use of respiratory equipment, and secondly, the code for measuring airborne asbestos fibers?

THE WITNESS: A. I was involved directly in both, yes.

Q. Did you write both of them? At least in its initial draft?

A. I didn't write a code for measuring asbestos, by myself, but I had input in it, and respirators, yes, I wrote by myself.

Q. All right.

Can I ask you just a couple of questions about the code for measuring asbestos fibers, and I take it that, indeed it's apparent in the regulation, that the ministry has opted for sampling on a forty hour time-weighted average basis?

A. Yes.

Q. There has at least been some discussion during the course of our Commission, and some debate over the question as to whether the time-weighted average should be done on an eight-hour sampling basis or a forty-hour sampling basis, and I wonder if you could explain to me the ministry's rationale for opting for a forty-hour time-weighted average?

A. The rationale, I think, has been given in various public meetings, counsellor, and what I will be doing now is just repeating what has been publicly stated, that for chronic hazards the standards, perhaps...not perhaps, but it is the fact that the ministry have agreed upon, unanimously, that for chronic hazards the standard based on forty hours is more accurate and gives you better information than those based on





A. (cont'd.) eight hours.

5 As far as sampling for forty-hour compliance, if that's what you meant, there are methods well laid down by various published materials which indicate the minimum number of hours that you have to sample in order to comply with a forty hour standard, as compared to an eight hour standard.

10 Q. I take it, and I'm not knowledgeable in these matters, but I take it that when you attempt to obtain a forty-hour time-weighted average, you don't in fact physically sample, necessarily, for the entire forty hours?

A. I think the key word is necessarily, yes.

15 Q. I take it you can take any week...you might sample just on a Monday, Wednesday and a Friday, and apply some average for the Tuesday and Thursday?

A. Yes, providing the hygienist knows about the process and the operations in the plant.

In other words, the hygienist must have very good knowledge of the profile of the plant, and the exposures and the process, whether it's intermittent, continuous...

20 DR. UFFEN: How did he get that?

THE WITNESS: The hygienist has various ways of getting...you can well appreciate the company hygienist will not have any problem, because the company hygienist should know what is going on in the plant so that there is no problem as far as company hygienists is concerned.

25 The governmental hygienists have various ways of obtaining that: One, reviewing the process of the plant and using his own expertise as to what he can expect in that kind of plant, and two, talking to the company hygienist and finding out from him exactly...

30 DR. UFFEN: Would you ever do several one-hour samples for a week or so...every hour until you got the profile of the plant?



THE WITNESS: If it's necessary, we will.

DR. UFFEN: You will?

THE WITNESS: Oh, yes.

DR. UFFEN: Have you done so at one time?

THE WITNESS: I think there are...it may not be in case of asbestos, but there are places where we have done extensive sampling of that kind, because of the challenge given to us.

DR. DUPRE: In your view, do government hygienists... strike that...in your view are government hygienists sensitive to different operations that sometimes can be carried on in different plant shifts? For example, if certain operations might perhaps be confined to the graveyard shift, would government hygienists be likely to be as aware of those as they are of the general operations that may be carried on in the plant?

THE WITNESS: The training of the hygienist is such that he becomes sort of a detective person, as well as a hygienist. I would expect from my professional hygienists to pry into all kinds of things, and to be aware of it as much as possible.

But as you can appreciate, Mr. Chairman, we may not always be correct.

DR. DUPRE: But as chief of your branch, you do not consider your hygienists as necessarily confined to a nine-to-five operation?

THE WITNESS: No.

DR. DUPRE: Thank you.

DR. UFFEN: Could I ask a specific one while we are on the subject, and then I won't have to come back to it later?

Am I correct in assuming that the time-weighted averages, whether it's eight hours or forty hours, assumes that the membrane filter method is being used with the same speed of



DR. UFFEN: (cont'd.) the...what's the correct expression?

THE WITNESS: The flow rate. The flow rate.

DR. UFFEN: The flow rate...constant flow rate all the time?

THE WITNESS: It does assume, for sure.

DR. UFFEN: How often is the calibration done?

THE WITNESS: I think we are talking two different things here. One is how often we observe the pump to see that the flow rate is maintained, and another thing is do we calibrate every time that we start a sampling. In both cases, I would say that our technicians are so trained that they practically stay there to see that the flow rate is maintained, and as soon as they observe that the flow rate is dropping because of the overloading of the filter, they have several steps that they must take, and we have indicated that in our code of measurement as well.

DR. UFFEN: What would you think of a technique that had a variable-speed motor so that the flow rate could be increased if need be, when things start to plug up, or if the dust level is low and you want to get a higher flow rate in order to get enough fiber to observe?

THE WITNESS: There is already. There is a constant-flow pump which has an electronic circuitry which takes care of that kind of thing, and it speeds up the pump and maintains the constant flow.

DR. UFFEN: Do you use them?

THE WITNESS: Oh, yes. We have quite a few constant-flow pumps, yes.

DR. UFFEN: Are they large or small? That is, are they small enough for an individual workman to use one without encumbering his work?





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5 THE WITNESS: Some manufacturers have bulkier constant-flow pumps, but now there are constant-flow pumps available which are not really bulky and they can be carried without problems.

DR. UFFEN: Thank you.

10 DR. DUPRE: Just one quick question, Mr. Rajhans. I was wondering if you are familiar with the study by Swimmer and Luce, of three asbestos plants, that has been done under the auspices of this Commission?

If you aren't, I don't want to have any hidden items on the agenda, it was that study that prompted me to ask the question about the extent to which your branch was sensitive to what goes on during different shifts, and perhaps that study could be very useful reading in your service, indeed.

15 THE WITNESS: Thank you.

DR. DUPRE: Counsel.

20 MR. LASKIN: Q. Can I draw on your expertise for just one or two further questions on measurement, and can I ask you this: Did the ministry give any consideration to putting into place alongside a fiber measurement, a mass measurement, which as I understand it is found in some other jurisdictions?

25 THE WITNESS: A. We considered mass measurement only from a theoretical point of view. We never did any experiments on it, as far as asbestos is concerned. We looked at it and we critically reviewed the British Occupational Hygiene Society publication by Roach, and subsequently in two of my papers in this compendium, if you look at the compendium, you will find that there is a commentary on mass measurement, but we did not have any firsthand knowledge because we did not do any practical work on it.

30 Q. Does it, from your experience and from your



Q. (cont'd.) judgement, have any advantages?

5 A. Mass measurements, as you are know, are probably aware, has one big advantage over any count method, and that is it's reproducability.

In other words, you can weigh the filter and in subsequent weighings come up with the same number, up to about three decimal places or something, because of the technique of weighing being very accurate.

10 Q. It eliminates the inaccuracies that you may find in count measurement?

A. Yes. Because in counts there are interweights, intraweights, intramicroscopists, intralab, so many variations and errors which get eliminated in weighings, so that is the main advantage of weighing over the counting method.

15 Q. What's the downside to it? Are there any...?

A. Oh, there are various downsides. I would like to, perhaps, read from the book here, but one of the main disadvantages is that, again, you don't know if you are weighing asbestos only. What are you weighing? You may be weighing grains most of the times, because don't forget that most  
20 asbestos fibers are accompanied with their parent rock grains, and the grains could be much more in weight than asbestos fibers, because they are really very fine.

So, you know, you could be reporting the results in a grossly overestimated manner. So that's the main disadvantage.  
25 People have tried several size-selective methods, but that doesn't work for the asbestos fibers because of various parameters.

Q. I take it the ministry...did the ministry give any consideration to the use of electron microscopy, in terms of workplace measurements? Was that issue considered?

30 A. Yes, it was considered and it is still being considered. We have a project on hand where the experiment is



5 A. (cont'd.) going on to find out a conversion factor between electron microscope counts and phase contrast counts.

In the past also, where we encountered low counts, we tried to check them under electron microscopes, but very, very infrequently we did that.

10 Q. I take it the ministry came to the conclusion at the present point in time electron microscopy is not a feasible method for routine monitoring of the workplace?

A. Yes.

Q. But you have this project ongoing?

A. Exactly.

15 Q. Has it produced any results yet? Have you been able to find a conversion between electron microscopy counts and phase contrast counts?

A. Not yet, because we are still fine tuning the technique, and one of the things that we are running into a little bit of problems with is which filter to be used for sampling. So there are some fine tunings that are still needed.

20 DR. DUPRE: Just to follow up on that counsel, as I take it, Mr. Rajhans, from 1975 on, we have a point two fiber per cc exposure limit on crocidolite. Is that correct?

THE WITNESS: That is the guideline we have been...

25 DR. DUPRE: Right. Now, when I recall your chart that we've already looked at, we are looking at some readings that are moderately below two fibers, if I remember right, about 1977, 1978, and then dropping down to the vicinity of one, something around that, just before your readings end.

30 Now, I take it, of course, that these are measurements of total fibers, or only measurements of chrysotile fibers, in that plant?





THE WITNESS: They are the measurements of asbestos fibers.

5 DR. DUPRE: They are the measurements of total asbestos fibers.

Now, the technique that you were using, in your view, did it permit the separate identification of crocidolite, if that is what you are looking for? Or would you have had to gone to electron microscopy for that?

10 THE WITNESS: If needed, yes, we would have gone to the electron microscopy, but the way we were counting, no, it did not permit any differentiation.

DR. DUPRE: I see. Now, insofar as the ministry in its proposed guidelines...sorry, its proposed regulation, with asbestos as a designated substance...proposes of course to differentiate between maximum exposures by fiber type, may I take it that your service was consulted on the feasibility of such measurements?

THE WITNESS: Oh, yes.

DR. DUPRE: How do you propose making this kind of differentiation feasible?

20 THE WITNESS: Oh, now it is very easy, Mr. Chairman, as far as differentiating the various types are concerned. The knowledge has increased, and the techniques, and I have explained some of those techniques in this book.

25 It would require collection of some bulk samples, first. Now, as soon as you collect the bulk samples, you let it go through the x-ray diffraction which differentiates between nonasbestos fibers and asbestos fibers, in that nonasbestos fibers like cellulose and wool and other things, would not give the same diffraction pattern.

30 Having done that, you use polarized microscopy and dispersion staining, which will differentiate between



THE WITNESS: (cont'd.) crocidolite, amosite and chrysotile, and also quantitatively indicate what the percent is.

5 Now, it is an old industrial hygiene art in this case, which lets you apply that kind of percentages to your fiber counts. Now, we all can see that there may be some mistakes in extrapolating that kind of figure. However, this has been done.

10 Now, if one suspects by examining the bulk sample that there is a lot of crocidolite, a lot of amosite, then right then the industrial hygienist decides to change or to accommodate the electron microscopy technique to do the sampling in such a way which will accommodate the electron microscopy made with transmission or scanning.

15 So I would say at this time and point, there is no problem in differentiating and using these various standards.

20 DR. DUPRE: Do I take it, so that I can try to understand it in rather simple layman's terms, that if you have a regulatory regime that differentiates by fiber type, the feasible measurement approach is to take the samples of total fibers that are then subjected to electron microscopy, so as to produce counts by different fiber types?

25 THE WITNESS: No. If I could just go back, the total fiber sampling and going to electron microscopy only is not going to help too much, unless two things are used somewhere in between. As I said, bulk sample is easier to analyze for various types of fibers than airborne samples, because in airborne samples, if you went to the diffraction electron microscope with x-ray diffraction, at the best...and this is based on my knowledge, Mr. Chairman, there may have been some techniques that I'm not aware of...but all it can do is differentiate between, for example, cellulose fibers and asbestos fibers, so  
30 you will be sure you are counting asbestos fibers, not any other fibers.



THE WITNESS: (cont'd.) But when it comes down to various types of asbestos fiber, then in my opinion the best indication can be obtained from bulk samples only.

DR. DUPRE : This is a bulk sample of the product?

THE WITNESS: Of the product...

DR. DUPRE: Of the product.

THE WITNESS: ...or a raft of samples collected from the floor or somewhere.

DR. UFFEN: Is the only reason why you would come to that conclusion...it's not obvious...why do you prefer the bulk sampling?

THE WITNESS: Because the technique that I am referring to is a geological technique which has not been perfected in types of samples of the particle sizes that you collect on the filter.

DR. UFFEN: What about the possibility that different types of asbestos behave differently in an air sample? Chrysotile, for example, versus crocidolite? Have you any experience that they might behave differently?

THE WITNESS: No, I don't think we see that kind of thing too much under the microscope that we are using.

Again, for that information I think electron microscopy would be very useful, to see that.

DR. DUPRE: Can I just make sure I again reduce it to my layman's terms?

In a regulatory regime that wishes to differentiate by fiber type, the feasible approach, as you put it, is to begin with bulk sampling, which can be samples of, as I take it, the product and/or samples of dust that is collected from the factory floor. These samples, as I take it, can then be used to establish what proportion is one type of fiber, what proportion is another type of fiber, and let us say that what is established





DR. DUPRE: (cont'd.) on the basis of your bulk sampling is that you have one crocidolite fiber for five chrysotile fibers.

Now, do I understand it...again in my layman's view in terms of just trying to understand how the regulatory regime is going to work...that from that point on you would be collecting air samples from time to time, and that if your chrysotile...no, if your total fiber count is one, on the basis of the proportions that you established in your bulk sample you are confident, if it was one part in five, that the point two is not being exceeded? Correct?

THE WITNESS: Yes.

DR. DUPRE: But at this point in time and what Dr. Uffen was asking you again, to get that one down to my very simple layman's terms, what you are assuming is that the airborne fibers of crocidolite and chrysotile bear a relationship to one another that is identical to the relationship that is found in the bulk sample?

I take it you are signifying yes, so that we have that for the record? I just want to make sure that an untrained engineer has some glimmer of what you are describing.

THE WITNESS: Yes, and very correctly so, and they should be.

I think what got missed out in my statement, which was intentionally put there, that the art of industrial hygiene is used and we are not being scientific. But this has happened throughout the history in industrial hygiene, where we have not had analytical technique going hand in hand with our sampling technique, and we have used various methods, but I would be the last to deny that your statement is correct, because I did also indicate that extrapolation could be grossly misinterpreted.



THE WITNESS: (cont'd.) But one other philosophy that we have always used in industrial hygiene, and should also be noted here, that if we have to err, we will err on the safer side.

So if we know that there is only a trace of crocidolite or something of that nature, that will make this standard more restrictive, based on that.

DR. DUPRE: Is there something else that can be used to help you get out of the little problem that I have been trying to sketch in my layman's way, and that would be to subject any of a number of air samples to electronic microscopy, as a monitor of the extent to which it was correct to assume that the distribution of fibers in the air is in fact the same as the distribution in the bulk samples?

Is that feasible?

THE WITNESS: Yes. But Mr. Chairman, are you suggesting it as a project or as a research thing that can be done?

DR. DUPRE: No, I'm just assuming for the sake of my argument, you see, that we have a regulatory regime in place that sets standards that differentiate by fiber, and having made that assumption I am simply asking, well, fine, that's the regulatory regime, now how can I be confident that the techniques are in place to enforce it so that the regulations are in fact meaningful?

THE WITNESS: Yes, then I think you are quite correct in saying, yes, there are sophisticated instrumentations which are time consuming and quite elaborate as well, but yes, they will be used, they can be used when it is challenged.

DR. DUPRE: All right.

DR. UFFEN: Could I pursue this just a little bit further, and I wanted to ask you from the point of view of a



DR. UFFEN: (cont'd.) scientist and engineer with a lot of experience, we've been told quite recently in testimony that at least one professional person believes that crocidolite behaves quite differently from chrysotile in air, particularly as it gets into the breathing passages and down into the lungs, and so it would appear to us right now that we have been presented with some evidence that may be quite significant, so if post mortem gives you one kind of result and measurement of air gives you another and measurement of a bulk samples gives you another, we better understand that.

Now, in your experience do you believe that there are any grounds, theoretical or observational, to suggest that crocidolite does behave differently in air?

THE WITNESS: My experience has been that unless the air has some moisture in it, an appreciable amount of moisture in it, the behaviour of the fibers is not significantly different. But as soon as...and this is a well-known fact, we tried that in our lab as well...asbestos does have the tendency to curl up as soon as it hits a liquid medium whereas ...I mean chrysotile has...whereas crocidolite tends to remain straight. So that's the only experience I have. There is nothing else I can say about it.

DR. UFFEN: You have trained in mineralogy more than any of our witnesses. Let me just speculate for a minute.

Is it possible that because of the different crystal structure of the chrysotile on the one hand and amosite and crocidolite on the other, that there could be surface charges, electric charges, that would mean that they would repel each other in very fine dust, and the presence of moisture might be the reason why those electric charges leak off?

THE WITNESS: This phenomenon is noticable in certain minerals, but...I mean it would be speculation totally,





THE WITNESS: (cont'd.) I have no reason to believe that this would happen.

5 DR. DUPRE: Just following up in this vein, while your mineralogists hat is still on, in your experience have you detected any propensity for chrysotile to adhere to other kinds of dust more readily than crocidolite does?

THE WITNESS: No.

10 MR. LASKIN: Would the Commission like to take a short break?

DR. DUPRE: We might do just that, for approximately... well, I suppose we want to take our luncheon break at one?

MR. LASKIN: Sure.

15 DR. DUPRE: So shall we now break for about just ten minutes, if we can, but definitely no more than fifteen.

THE INQUIRY RECESSED

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THE INQUIRY RESUMED

20 MR. LASKIN: Q. I know Dr. Uffen has a particular line of questioning he would like to pursue with you, but I wonder just before that if we can clarify and just finish up the discussion that you were having with the Commissioner before the recess, and I just want to make sure I understand what the intent of the proposed regulation is when you are dealing  
25 with a workplace which is using more than one type of fiber.

Let us suppose that I decide, for whatever reason, to open up an asbestos-cement pipe operation in Ontario, and I decide that I have to use both chrysotile and crocidolite to manufacture that asbestos-cement pipe.

30 Now, can you tell me, under the proposed regulation, what standard I as an employer will have to meet in that workplace?



THE WITNESS: Under the proposed one, the standard that you will have to meet will be a more restrictive one.

5 In other words, if it has crocidolite along with chrysotile, then the standard will be applied under the proposed regulation the way it is written, will be one of the more restrictive type.

Q. So that no matter what my fiber type exposures are, will I generally have to meet point two?

10 A. If it is crocidolite and...

Q. And chrysotile.

A. ...and chrysotile, the crocidolite will have point two, the way the proposed regulation reads.

That's the legal...

15 Q. Well, let's assume you do a sample of dust on the floor or the product, and you analyze it and you come up with, to use the Chairman's example, for every five parts chrysotile there is one part crocidolite, and for every five fibers of chrysotile there is one fiber of crocidolite.

20 Now, does that mean that everytime air sampling is then done in the plant that, you now have a composition of dust and fibers which is a mixture of chrysotile and crocidolite, that the exposure levels for all of the samples will have to be at point two? Is that the intent?

A. That's the proposed regulation, that's the way the proposed regulation is written, yes.

25 Q. So that...and this is where I became confused, because when the chairman put an example to you of that situation, one fiber of crocidolite for every five fibers of chrysotile, and asked you if the level at the plant was at one fiber whether you would then be complying...and I had thought your answer to be in the affirmative?

30 A. I'm sorry. I misled the Commission, because



5 A. (cont'd.) that one fiber that was being referred to, I took it to mean one fiber of crocidolite. You see, when it was being explained to me that if you have one fiber for every five fibers, and if you find one fiber, as far as I am concerned, that one fiber of crocidolite if you can detect, yes.

10 But I think...I should really thank you for clarification...the proposed standard is intended the way you state it.

Q. To meet the more stringent standard?

A. Exactly.

Q. And the sampling is done, I take it, essentially to identify what is actually there?

15 A. That's right.

Q. Okay.

DR. DUPRE: Just so the Chairman now understands fully, let me try to go through it in the following way, Mr. Rajhans.

20 I will take the example of Mr. Laskin's hypothetical new plant...

THE WITNESS: The regulations, please? Can I follow the regulations?

MR. LASKIN: Let me put it in front of you, the September, 1981, version, section four...

25 THE WITNESS: Sorry, Mr. Chairman. I don't have a copy.

DR. DUPRE: May I proceed now?

THE WITNESS: Yes.

30 DR. DUPRE: Okay. I will take Mr. Laskin's hypothetical new plant, and as I can take it, you could determine from bulk sampling, for example a bulk sample of the proposed product, what is the proportion of crocidolite to chrysotile





DR. DUPRE: (cont'd.) in the end product, correct?

THE WITNESS: Mmm-hmm.

DR. DUPRE: You could also, quite possibly, take some, on an experimental basis, some dust measurements and again, in an effort to determine what proportion of crocidolite to asbestos fiber, total asbestos fiber.

Now, on this basis my question is, let us assume that your bulk samples show that it's one part crocidolite in five.

THE WITNESS: Yes.

DR. DUPRE: Now, from this point on you will be taking some air samples, membrane filter air samples. Let us say that those samples consistently show that there is only one fiber per cubic centimeter of air, one asbestos fiber per cubic centimeter of air. Is the point two standard for crocidolite, from this point on, regarded as met?

It is not?

THE WITNESS: No, no.

DR. DUPRE: Okay. Now, I want you to explain to me how the point two will be regarded as met.

THE WITNESS: If the sample has shown that there is crocidolite in it, then regardless of what other types of fiber..the way the regulation is written, Mr. Chairman...I have to elaborate on it a little further, but let me say that the way the regulation is written, if any other type of asbestos fiber...that is, other than chrysotile...which has more stringent numbers in the regulations, is found to be present, then the more strict standard will apply, so one fiber per cc will not show the compliance.

DR. DUPRE: It will have to be point two fibers per cubic centimeter of any kind of fiber, is that it?



THE WITNESS: Exactly.

DR. DUPRE: Okay, thank you.

5 MISS JOLLEY: Mr. Chairman, I think there has been a new proposal since September 22nd, on the actual TWA's, and I wonder if that could be made available to us? My understanding is that that's stated in the newest one that went to the advisory council last week.

10 That's not as it is written in the September 22nd proposal, is what I'm saying, and I gather it is written that way in the newest proposal.

MR. LASKIN: Perhaps my friends to the left can clarify it.

15 As I understand it from Mr. Gladstone, the evidence Mr. Rajhans has just given is essentially the intent of the regulation even as it is expressed there in Section Four, subsection D, and I must confess that looking at subsection D, at least to me, it's not perhaps as clear as it might be, and I gather from Mr. Gladstone that at least that section, subsection, has been rewritten to more clearly express what the intent of the  
20 regulation was. Is that..did I put it fairly?

MR. LEDERER: That's certainly my understanding, Mr. Chairman.

MISS JOLLEY: Could that be made available to us, the new wording?

25 DR. DUPRE: If you want to raise that as a question, I think that that is something, Miss Jolley, that perhaps I will want to consider with my Commission colleagues, because I think that one of the matters of interest to this Commission has to do with the extent to which the particular process that is now in place is serving government well in terms  
30 of producing timely regulations, and I would want to confer with my colleagues lest, perhaps, that some request for information



DR. DUPRE: (cont'd.) might interfere with our capacity to observe what is unfolding before us.

5 Of course, it may well be that within a very short time that this is one of the things that we don't know, and that perhaps we may not wish to know until we find it out.

It may well be that in a very short time there will be a promulgation. We don't know.

10 So perhaps we might just leave it at that for the moment, and I might confer with my colleague, as indeed you may, Mr. Laskin, wish to confer with Mr. Lederer.

DR. UFFEN: Mr. Rajhans, could we go back to some of the technical things? I have a whole bunch of questions which I suspect you can give fairly short answers to, because they deal with measurement techniques and the control of ventilating  
15 systems, and so on. They have arisen because of conflicting testimony that other people have given us. We have heard this, and then we've heard that. So they are not in entirely good order.

20 I would like to go back to that membrane filter method and ask you, what is your understanding of what determined the minimum-length standard of five microns? You know the length-to-diameter aspect ratio? Where did that five microns come from, and why?

25 THE WITNESS: As far as my knowledge is concerned, five microns was an arbitrary parameter that was selected by Edward and Lynch, at that time, in 1969, and subsequently followed by BOHS, British Occupational Hygiene Society.

30 Now, when I say arbitrary, it requires some explanation as to why they restrict to five microns. There have been all kinds of speculative theories on that. One can go on and on using...or reiterating various theories of various researchers and organizations, but frankly speaking, I would say





5 THE WITNESS: (cont'd.) that most of those statements by those people have been sort of defending, not very successfully, the parameters they have used arbitrarily.

One of the theories, obviously, which must have come in front of the Commission is that perhaps the resolution power of the microscope is such that five microns in length has been considered. Maybe so. That can be debated.

10 There are theories that perhaps it was based on some scientific evidence that, you know, macrophages...again, I'm not a medical doctor...the size of macrophages had something to do with it.

15 But as I said, and I re-emphasize, that it was an arbitrary thing somebody dreamed up, and most of the industrial hygiene things are arbitrary and now they are trying to defend.

DR. UFFEN: Thank you.

20 Now, a somewhat similar one. We've been told by a variety of people that you can use the membrane filter method to measure, down to a certain size or magnitude, fiber count. It has been quite a wide diversion.

25 Can you give us your evaluation of the lower limit that you can use the membrane filter technique with consistently reliable results?

THE WITNESS: Yes, I should be able to give you that one, because my experience in that field has been extensive, and if I could just quote from what I said in this book, and it still is valid, if you will bear with me...somewhere...it has been indicated..

DR. UFFEN: That's your first book?

THE WITNESS: No, this is the second book.

DR. UFFEN: The second book?

30 THE WITNESS: Yes. In the second book, I delved into this rather extensively. What I indicated, going by...if



THE WITNESS: (cont'd.) you'll just bear with me...

DR. UFFEN: Well, can you remember it without having to quote the page?

THE WITNESS: Yes. Well, yes. If I remember it correctly, if you go by ninety minute samples, then point one is just about the limit where you can be statistically accurate.

DR. UFFEN: And if you go for a shorter time?

THE WITNESS: No, no. If you for..oh, shorter time will be less.

DR. UFFEN: Reliable?

THE WITNESS: Less reliable, and in shorter time, in one of our papers on the statistical correlation, we showed that the standard deviation is about zero point two fibers per cc, for shorter...like fifteen minutes sequential sampling.

The detection limit of point one can be improved upon by two methods, or two means, or two ways. One is by having longer sampling time, and the other by counting more fields.

When we reported zero point two fibers per cc as a standard deviation of the counts, we were counting only twenty fields. When twenty fields got increased to one hundred fields, we agreed with NIOSH that point one fibers per cc is reasonably achievable within about thirty-five percent accuracy, which is really nothing in terms of industrial hygiene.

Now there is a move afoot to count, and we are, by the way, co-operating in that study with NIOSH, to count perhaps three hundred, five hundred fields, which is very cumbersome as you can well imagine, just to see how much we can stretch.

DR. UFFEN: But that would still be the same time of collection?

THE WITNESS: That's right. Collection we would



THE WITNESS: (cont'd.) not disturb, but we will count more fields just to see if we increase the...

5 DR. UFFEN: But now if you go to a longer period of collection - say you went for four or five hours - would that improve the reliability of the method?

THE WITNESS: Yes, it could improve, because the reliability of the counting method depends on the number of fibers you see in total.

10 DR. UFFEN: Now, in the process of going to a longer counting method in order to get better results, you have to average the results over that longer counting interval, so am I correct in assuming that it would no longer be so good in identifying the profile that you use...you know your expression a little while ago...your data profile, let's say we had a  
15 measurement every hour or ninety minutes...let's say ninety minutes. We would lose that profile if we go to a longer collecting time.

THE WITNESS: I suppose you are right. Yes, not I should suppose, but yes, I can't deny that, that profile.  
20 Yes.

DR. UFFEN: Now, we've been told by another witness of a technique which apparently is still in the research stage, where you might have the filter membrane designed in such a way that it could rotate and that you could count a sector that had been exposed for eight hours, and another one for  
25 sixteen, and another one for twenty-four and so on.

Are you familiar with this technique?

THE WITNESS: No, I'm not.

DR. UFFEN: Does it sound sensible?

THE WITNESS: I would like to see the method  
30 that will rotate it. Anything is reasonable or sensible if somebody can demonstrate to you, and since I have not had any





THE WITNESS: (cont'd.) personal knowledge, I would not like to second guess.

5 DR. UFFEN: Well, you've had a lot of experience. Can I make a quick shift now to another part of your experience, and that is ventilation. I understand you started out in mine ventilation?

THE WITNESS: That's right.

DR. UFFEN: Your thesis was on this, I believe?

10 THE WITNESS: Yes.

DR. UFFEN: To what extent is it sensible, possible, reasonable to recirculate the air in a plant, and what precautions would you have to take?

15 THE WITNESS: As far as asbestos is concerned, based on the experience I have and I am also giving the Commission the benefit of the experience of the ventilation committee members, who write the ventilation manual, industrial ventilation manual, which is widely used...their opinion, and I agree with them because it has been my experience as well, that asbestos is one of the easiest dust types to filter, and hence to control by filtering.

20 Asbestos forms, after a very limited time, very shortly, forms a very nice cake by itself on the fiber bags, or bag filter, and thus makes it much more efficient, believe it or not. This is true.

25 So coming back to recirculation, it is the opinion of the ventilation committee, and I agree with it, that if proper monitoring method is used for the return air, asbestos laden air can easily be circulated.

30 DR. UFFEN: Are there any problems? For example, getting too much carbon dioxide or other gasses in the air, when you are recirculating?

THE WITNESS: We are not...okay. I don't see,



THE WITNESS: (cont'd.) really, how carbon dioxide would really become a problem, Dr. Uffen, because...

5 DR. UFFEN: How about bad air? In the mines, you know, we used to...

THE WITNESS: Yes, that's it.

DR. UFFEN: ...we called it bad air. What did we mean, lack of oxygen, I guess.

10 THE WITNESS: Well, not as much as lack of oxygen in the sense, you can say lack of oxygen, but really it was...you know, lack of oxygen is evident only if it falls well below sixteen percent, or something, which is really very difficult...or not very difficult, not easily found, because carbon dioxide really becomes the problem. If carbon dioxide goes above five thousand parts per million, or even a thousand parts per million, people start experiencing a headache or some other kind of stale-air syndrome.

15 But you can well imagine five thousand parts per million in percentage is nothing which will replace the twenty-one percent down to sixteen percent. It will never happen.

20 So really, the lack of oxygen is not what is the bad air. It is the stale air due to the elevated carbon dioxide.

25 DR. UFFEN: Have we any plants in Ontario or in Canada which already have used the type of ventilation which recirculates the air?

THE WITNESS: Oh, yes.

DR. UFFEN: Asbestos users? Is that easily available to us?

THE WITNESS: Yes.

30 DR. UFFEN: I'm not going to ask you to recite it now.



THE WITNESS: Canadian Johns-Manville  
recirculated asbestos-laden air for a number of years.

DR. UFFEN: At the Scarborough plant?

THE WITNESS: Yes, and that's a well-known fact.

DR. UFFEN: I'm going to make another little switch  
In the asbestos mines, my experience is it's usually wet, cold  
and miserable, but I guess it depends on what part of the mine  
you're in, but in a plant is the humidity control important?  
To keep the asbestos fiber count down?

THE WITNESS: Most of the asbestos mines...well,  
let me backtrack a bit. The answer to your question is, could  
be simply yes. If the humidity level is high, the dust will  
have less tendency to get airborne and will settle down. The  
answer is yes.

DR. DUPRE: In particular of chrysotile dust,  
as distinct from crocidolite dust, or other wise?

I'm just thinking...

DR. UFFEN: The Chairman is becoming a scientist  
very rapidly.

THE WITNESS: I don't have a firsthand knowledge,  
Mr. Chairman, on asbestos mines. I was trying to visualize  
some of the asbestos mines that I have gone in, but unfortunately  
most of them have been open cast, and open cast mines really,  
humidity never becomes a factor to the extent that you can  
say, hey, it's more humid today, it's raining today or it's not  
raining tomorrow, so it's only in underground mines when humidity  
has some appreciable effect.

DR. UFFEN: Does it make a difference when  
you go, for example, from a mine to a mill to a manufacturing  
plant, where they are making textiles?

THE WITNESS: In what way?

DR. UFFEN: Well, is it correct that in some of





DR. UFFEN: (cont'd.) the manufacturing systems you must keep it dry, that the whole technique of weaving and so on is jeopardized unless everything is quite dry?

THE WITNESS: In the textile, it may be just the opposite. In the other processing plants where fibers are bagged and packaged, I think you are right.

But in the textile, I think they need humidity somewhat, otherwise they will have problems in getting the threads broken, or something.

So I would say it's just the opposite in the textile.

DR. UFFEN: You may be quite right, and I don't know. But the point I was trying to get is, apparently the humidity control could be dependent on the operation that you are involved in?

THE WITNESS: Oh, yes, that's right.

DR. UFFEN: What's the lowest reasonable fiber count that can be attained in an asbestos textile plant?

THE WITNESS: In Ontario, we have very limited experience with asbestos textile plants, but based on what I have read elsewhere and whatever knowledge I gain from talking to people, from carding onwards they can easily maintain two fibers and below that, possibly to one. But then there are always some excursions in various plants, various operations.

DR. UFFEN: One more question, and this is another kind of a quick change.

We recently had testimony from Ontario Hydro representatives, and they presented us with...I think it was called asbestos hazard index...which they used to decide whether things have got beyond an acceptable limit. Have you heard of this index? Are you familiar with it? And is it any good?

THE WITNESS: I have heard of several indices,



THE WITNESS: (cont'd.) as a matter of fact.  
Harris Index is world famous now.

5 DR. UFFEN: Which one?

THE WITNESS: Harris Index, which is used for  
determining a hazard in insulation places like schools and  
public buildings, by some, and then there is all kinds of  
arbitrary indices people are coming up with. I have not had  
any personal knowledge and I can't comment. I don't know  
10 whether it's good or not.

For screening purposes it may be all right.

DR. UFFEN: Have you ever considered establishing  
such an index for your own industrial hygiene purposes, so that  
you know when the index gets above a certain number you invoke  
other procedures?

15 THE WITNESS: No. No, I haven't.

DR. UFFEN: Thanks very much.

MR. LASKIN: Q. Can I just ask you a few more  
questions, Mr. Rajhans, and can I draw on your experience again  
of being in charge of a branch that is looking at, for example,  
20 asbestos in workplaces, and your prior experience as a dust-control  
specialist, and what I want to ask you about is your judgement  
and your opinion about the capability of the firms that are  
operating in the asbestos field now, to achieve from a  
technological point of view the proposed one fiber standard for  
chrysotile.

25 Can you help us with that question?

THE WITNESS: A. All I can say is what I published  
in one of the papers when I reviewed the asbestos-exposure  
experience in Ontario, which is in this compendium, and my  
conclusion has not changed since then.

30 If you...

Q. You are taking, I take it, tab nine?



A. Exactly, yes.

Q. And that is as a result of looking at five plants?

A. That's right.

Q. Is plant E, by the way, the Johns-Manville plant?

A. I forget now. I would have to go back and check, and I can report back on that.

Q. All right. But your conclusion there was that a fiber level of two was achievable? Written in 1977?

A. Yes, but are you reading the conclusions?

Q. Yes.

A. Oh. I'm sorry, you have to read the discussion of results part to get to the feasibility that was referred to.

Q. All right.

A. And especially if you...

Q. The last paragraph on page 770?

A. That's right.

Q. All right.

A. That could be.

Q. Can we just pursue that last paragraph, which starts with the sentence:

"We have no doubt that fiber levels of point five per milliliter, and point one per milliliter, can be achieved"...and then you go on to describe in general terms that the methods would have to be different?

A. That's right.

Q. Do I take it that at the time you wrote this article that the methods that you suggest would have to be in place to achieve these levels, were not generally in place in asbestos-manufacturing operations in Ontario?





5 A. That's right. And those, as I say, will be different from those of local ventilation and careful housekeeping practices, which I have indicated had resulted in reducing the exposures in various plants down to about one level, one fiber per milliliter, with some excursions here and there, which were already in place.

10 What I was trying to indicate here, that those methods have reached the plateau and anything below one needs different control measures and whatever.

Q. Does, in your judgement, the technology exist at the present time, in 1982, to implement the different methods that you suggest?

15 A. As far as the technologies are concerned, they are available. But the cost will be, perhaps, prohibitive, as well as the installation and any other method that can be used will take much longer time to start anything of that kind, so it's time and cost which will be quite...

20 Q. But let me just ask you a couple of followup questions. Number one, are there, to your knowledge, any companies today manufacturing products with asbestos, that are implementing the kinds of methods that you have contemplated in this paper...

A. No.

Q. ..to get down to point five?

A. No.

25 Q. No? They are still essentially operating with local exhaust ventilation and careful housekeeping practices, as you describe them?

A. And use of respirators.

Q. And use of respirators?

30 A. That's right. Those are the only ones.

Q. Have you read the paper that was commissioned





Q. (cont'd.) for this Commission, by one of your co-authors of one of your books, Professor Bragg, by any chance?

A. No, not yet.

Q. You haven't had an opportunity to read it yet?

A. No.

DR. DUPRE: While we are at tab nine, I was just wondering if I could...

MR. LASKIN: Yes, by all means.

DR. DUPRE: ...pursue a couple of questions.

I was interested in reading this paper, Mr. Rajhans, that...well, particularly with respect to plants B and C, whose experience is plotted on page 769, that these plants in both instances show some distinct success in getting fiber levels down to relatively-small amounts, and I'm looking in particular at the 1975 readings.

Now, your paper distinctly comments on page 70, about the unsatisfactory performance of plant B, where of course, as your chart on page 769 makes clear, the exposure level skyrocketed after 1975.

Now, meantime however, your observation about plant C is that there is indeed consistent improvement, although your plant C chart shows that going back up to one fiber from what seemed to be slightly lower levels.

Now, I'm not sure if what I have is a question, Mr. Rajhans, or if what I have is a disposition which then will end with the question, tell me if I'm nuts. But the point on which I would like your reflections is the following: One approach to the regulation of hazardous substances is that if we are going to set numbers, well, if that's what the regulatory regime calls for, then we shall have those numbers.

However, at this point the regulatory philosophy that I wish to share with you expounds, notwithstanding what



5 DR. DUPRE: (cont'd.) the numbers may be in  
terms of exposure levels, notwithstanding what the regulatory  
numbers may be, a good occupational health regulatory regime  
will in all instances create incentives so that any and all  
plants that can indeed achieve exposure levels that are below  
the regulated control level will be encouraged to continue to  
do so, and indeed will be encouraged to consistently do better.  
10 This may be, if you will, the idea of, let us say, piggybacking  
a low-as-reasonably-achievable principle onto a numerical  
regulatory regime.

15 Now, when I think of the current regime that we  
now have in place, which designated a substance, as asbestos is  
about to be designated, which fixes a number as a control level,  
and which then is a regulatory regime imposed on a real-world  
situation where the experts are well aware that a number of  
plants are doing better than the control level.

20 To what extent do you, as a key figure in the  
administration of this regulatory regime, believe that you have  
the administrative tools - whether these be in terms of the  
language of the statutes or in terms of the language of your  
regulations - that will enable you, and notwithstanding whatever  
the numerical control level is, to be able to say to a plant,  
good, you are below that level, now keep trying to get it lower,  
and above all, don't creep up to what is the numerical control  
25 level?

Do you feel that you have the statutory and  
regulatory tools that would enable you to do this, to encourage  
the continuation of best-possible performance by your already-  
good performers?

30 THE WITNESS: Mr. Chairman, that's a very  
difficult question for me to answer. I am not very knowledgeable  
in the legal aspects of regulation. Anytime I need that kind of



THE WITNESS: (cont'd.) interpretation, I go to the legal counsel. So I'm sorry, I don't have any opinion at this time.

MR. LEDERER: Mr. Chairman, might I make a suggestion to you? I think if you reserve that question for Mr. Gladstone when he gives evidence, I think that you may learn a little more about it and may get a more positive response.

DR. DUPRE: Thank you, indeed.

Perhaps this is exactly the appropriate moment at which to break for lunch and to resume at quarter past two.

Thank you very much.

THE INQUIRY RECESSED

- - - - -

THE INQUIRY RESUMED

DR. DUPRE: Are we ready to resume?

MR. LASKIN: Mmm-hmm.

DR. DUPRE: Counsel, if you please.

MR. LASKIN: Q. Just a couple more question, Mr. Rajhans.

Can I just, before we leave tab nine in the compendium of articles that you provided to us, and can I just come back to your view on what was necessary, what would be necessary to come down to point five or point one, and as I heard your evidence before lunch, it was to the effect that the costs would be considerable, in your judgement.

THE WITNESS: A. Yes. Some of the obvious things that one has to do, and I have hinted at some of those later on in the same paragraph that we were quoting from this morning, like, you know, the last sentence I say:

"The order of magnitude increases in collection





5 A. (cont'd.) "efficiency necessary to achieve zero point five fibers per milliliter and zero point one fibers per milliliter, may only be obtained by totally-enclosed processing, all-wet processing or some similar technology."

10 That would mean very good enclosures on everything. It also... it may necessitate, at times, putting the operators in an enclosed environment with some automatic device to control, and only occasionally he goes into the plant to inspect the things, so the average exposure remains below point five.

15 The things similar to that have to be done if we want the exposure to go below point five, or go down to point one. Obviously one can argue that dust respirators, or air-supplied respirators, could also achieve point one. But when I say all this, I say that with some trepidation because we are approaching the limit of almost clean air outside, so what we are bringing in in these enclosed booths, or operators or air-supplied helmets or something of that nature, we have to be  
20 very careful not to assume, without doing any quality control, that that air is below zero point one.

25 Q. My only question to you is, do you know whether the ministry itself has attempted any cost estimates to put in place the kind of methodology and technology to which you are referring, and if so, have you yourself been involved in that process?

A. I do not recall...I do not recall any project of that kind that I have been involved in.

Q. Or which the ministry has been involved in, to your knowledge?

30 A. No, I'm not aware of that.

Q. Just finally, one or two questions about your



5 Q. (cont'd.) branch. Am I correct that most of the time, if not indeed all of the time, your branch is essentially involved in responding to requests emanating from the industrial safety branch, from the inspectorate in the industrial safety branch, or the construction safety branch?

A. Yes. If you include both industrial and construction, you are very correct in saying that mostly we have been involved in that.

10 Q. Okay. And on the industrial safety side, what does that involve, being called in on work refusals?

A. No, there are all kinds of categories. Work refusals is just one of them.

Q. Okay. What else?

15 A. The bulk of the requests come from the inspectors while going on their cyclical visit, noticing health hazards and trying to use our service, our consulting service, to further determine what extent the hazard is...the ability of hazard, and for further recommendations from us.

20 Q. Your branch is not involved in the initial identification of a hazard, if I can put it that way, in the workplace, am I correct? You get called in once the front line inspectorate has identified a potential hazard?

A. Generally speaking, yes.

Q. And is that true both on the construction side as well as the industrial side?

25 A. Yes.

DR. DUPRE: Incidentally, do you like it that way?

THE WITNESS: Are you asking me personally?

DR. DUPRE: Yes.

THE WITNESS: Oh, I enjoy it.

30 DR. DUPRE: In other words, having a consulting relationship to inspectoral branches is, in your view, the appropriate



DR. DUPRE: (cont'd.) niche for your service in the particular railroad organization I am looking at here?

5 THE WITNESS: Let me put it this way, Mr. Chairman, that is has worked so far and I think we have no reason to doubt that kind of system or approach.

MR. LASKIN: Q. And just finally, as I understand it, at one stage, perhaps some years ago, your branch had a rather active program for reviewing asbestos manufacturing operations?

10 THE WITNESS: A. I'm trying to understand the line of questioning here.

Q. Well, as I understand it, say in the early-seventies through themid-seventies, you were...perhaps if I can put it, more actively involved in asbestos program with respect to those companies, plants, manufacturing asbestos products?

15 A. Yes, we were.

Q. And what has happened to that program?

20 A. I think several things which have evolved recently, which have changed that approach, and now we do not try to monitor the companies in the sense that they can be... there's a danger there...they can be used as to circumvent the internal responsibility system, because we wanted them to start their own monitoring and we are ready to help them, but if we keep monitoring for them at every stage, then the possibility is that they may never embark on their own monitoring program and keep using our own monitoring data.

25 So that has been, I think, one of the reasons, plus there have been several other priorities which have kept our resources totally occupied and we have not been able to pursue that kind of thing, which we did in the past...if I can use the word literally...because we had time on hand.

30 Q. Is there any sense within your branch of the





5 Q. (cont'd.) ministry, now that the internal responsibility system is in place, that perhaps your branch or the ministry has withdrawn too quickly, if I can just use that colloquial phrase, from its supervisory role?

10 In other words, is there any sense within the ministry that perhaps the expectations of the internal...what you ultimately hope the internal responsibility system will produce...that you perhaps have assumed it would be in place more quickly than might in fact be the case?

A. Are you looking for an example of any kind?

15 Q. No, I'm just asking you what your judgement is, sitting in the branch and having had a long responsibility for supervising, auditing the workplace.

20 A. Well, again, let me put it this way, that if we ever had that kind of inkling, if we ever thought that that might be the case, we will jump back in and start doing it, because nothing prevents us, precludes us, from doing that kind of thing. But it has to be a judgemental thing by looking at any program or anything that we did in the past, because the underlying philosophy hasn't changed - that is, to protect the health of the workers, you know, as effectively as possible.

MR. LASKIN: All right. Thanks, Mr. Rajhans.

25 DR. DUPRE: Just one followup question, if I may. I want to go back to your description of the occupational health hygiene service as a consulting service to the inspectorate.

I take it that it is a consulting service to inspectors from the industrial safety branch and from the construction branch. What is your relationship to the mining branch in terms of consulting services?

30 THE WITNESS: Mining branch has its own component parallel to ours.





DR. DUPRE: They have their own hygienists?

THE WITNESS: Yes.

5 DR. DUPRE: Mr. Rajhans, I'm going to ask you the same question as I asked you about whether you like your relationship with the industrial and construction branch. Are you content with the situation where there are apparently parallel hygienists to your service, which act as a consulting service to the industrial and construction branches, but then 10 hygienists who are not in your service, but who serve the mining side of the operation? Are you content with this, as an organizational-chart situation?

15 THE WITNESS: There haven't been really any problems, so I have to say yes, because it has worked all right because they do recognize our service as the senior hygiene component. In other words, it works...they work in consultation with us all the time, and any policies or procedures on industrial hygiene never get approved without our input. So in that respect I have not really had any kind of reason to be dissatisfied.

DR. DUPRE: Thank you very much, sir.

20 Now, may I, once again, ask for the batting order, please?

Mr. Starkman? Or Mr. Lederer?

25 MR. LEDERER: Well, Mr. Chairman, as with Dr. Vingilis...you will recall the same question arose then and I took the position that since I appeared here on behalf of the Provincial Government and since Mr. Rajhans is here in his role as a public servant, it would seem most fitting that I go last.

I think my friends agree.

DR. DUPRE: You may certainly bat cleanup, Mr. Lederer.

30 MR. LEDERER: Thank you, sir.

DR. DUPRE: May I then go to Mr. Starkman?



MR. STARKMAN: Thank you, Mr. Chairman.

CROSS-EXAMINATION BY MR. STARKMAN

5 Q. Mr. Rajhans, I still don't have a good feeling for the size of the unit we are talking about and what its precise functions are. If you could start back before you became part of the Ministry of Labour, in the period, I guess, prior to 1977 when you were a dust specialist, how many dust specialists would there have been at the Ministry of Health?

10 A. Going back to 1968, 1969, period, I think I was the only one, and then I got help in 1970, if I recall correctly. So then from there on there were two so-called dust .....either you can call them specialists or seniors, or whatever, and...

15 Q. Yes.

A. ...that continued, I think, until 1977 or so, when the branch got reorganized, or the service got reorganized, and the concept of a specialist was eliminated and we needed more generalists, so...

20 Q. What was the service referred to as, when it was part of the Ministry of Health?

A. Occupational health engineering service.

Q. Occupational health engineering service?

A. Right.

Q. Of the Ministry of Health?

25 A. That's right.

Q. So in the years before 1977, there were two dust specialists, I'll use that word, and who else would have been involved in that service?

A. Oh, we had three kinds of specialization - dust, chemical and physical agents.

30 Q. Okay.

A. So besides dust specialists, we had chemical



A. (cont'd.) agent specialists and physical agent specialists, and then we had chief of the service.

Each specialist will have subordinates helping them.

Q. So there was two dust specialists and there were subordinates under you as well?

A. No, no. Sorry. For chemical specialist, he had his own subordinates.

Q. How many chemical specialists would there have been?

A. I have to jog my memory just to be correct in numbers. I would say there would be about three or four chemical agent hygienists or engineers, or whatever you want to call it.

Q. And they had subordinates?

A. No, no. Chemical agent specialist had the subordinates - like four or five - they were all at the same level. There were no other line subordinates for them.

Then the noise had one help, one subordinate.

Q. How many people would there be working with noise?

A. Noise was the same as dust, two.

Q. Two. And there was a director of this unit?

A. The chief of the service.

Q. Who was that?

A. Mr. Nelson.

Q. So all of these people would report to Mr. Nelson?

A. Yes.

Q. Who would Mr. Nelson report to?

A. At that time, director of the branch.

Q. Who was that?

A. For awhile it was Dr. Mastromateo, and then





A. (cont'd.) Dr. Tidy became the acting director.  
So on and so forth.

5 Q. Okay. Let's deal with it now, under the  
Ministry of Labour, the way it presently is. You say there is  
no longer, you don't refer to them as dust specialists anymore?

A. That's right.

Q. Well, what do you refer to the people as now?

10 A. They are...there are two levels below myself  
in the service.

Q. You are the chief of the service?

A. I am the chief of the service.

Q. Yes.

15 A. Under me there are occupational hygiene  
supervisors. These are regional managers. We are regionalized  
completely now.

Q. How many regions are there?

A. Hamilton, Sudbury...I think five. Five regions.

Q. Covering the province?

A. Yes.

20 Q. And there's five regional managers?

A. Yes.

Q. Are they located in the field, or are they  
here in Toronto?

25 A. Except Toronto West, they are all relocated  
now, they are all located in the field. Toronto West will be  
located...and don't hold me to it...by mid-July or so.

Q. Okay. And under those regional managers, how  
many?

30 A. Under regional managers, depending upon the  
percentage of requests - and we did some work on it - it could  
vary from one to four or five, and they are called consultant  
occupational hygiene (sic). They are the field people.



Q. Now, you described the function as being a consulting service and you just said it seems to work on requests. Who do the requests come from?

A. The requests come from the line branches, i.e. the industrial health and safety branch and construction health and safety branch.

Q. So you don't really...would it be fair to say you don't have any independent decision making in terms of what jobs you do? You respond to requests? Someone says would you monitor this plant or this plant, or this operation or that operation, and then you arrange for it to be done? Would that be an accurate way of describing it?

A. At this time, that is what is right, correct. I say at this time quite advisedly here, because our time and resources have been completely used up in just looking after the requests, but that does not mean that we do not have the privilege of starting something independently and on our own.

Q. Well, have you ever done that?

A. Yes, we have.

Q. What independent projects have there been over the last five years?

A. I would have to go back and check exactly what we have had, but we had quite a few...like, if we want to survey all the hospitals, if we want to survey all the foundries to find out what conditions they are in, printing presses, some small places where the lead exposure may or may not be there. There have been several. I'm sure, if I go back and sit down I can give you more examples, or the subsequent people testifying from the ministry can give you some examples.

DR. DUPRE: There are no examples in the field of asbestos, though?

THE WITNESS: Mr. Chairman, in the past there



5 THE WITNESS: (cont'd.) have been examples in the field of asbestos, and I think this was brought out, that we did have a list of the companies that we followed on our own, without any request from the line branches.

MR. STARKMAN: Q. Well, I think this is my..what I'm trying to get at is a feeling as to how your service works.

10 Let's just take the plant in Scarborough, the Johns-Manville plant. Would it be that you would receive a request to go and monitor the...take dust samples at that plant? And you would only respond, talking about a normal case, you would only respond when you received a request, to go and do that?

Not with that particular plant, but with any plant, any asbestos user, would you only go to that plant in response to a specific request to go and monitor?

15 THE WITNESS: A. I think your statement will be valid if you took the word 'only' out.

Q. All right.

Well, obviously you go in response to a request, that's one example?

20 A. That's right. That's right.

Q. Now when you receive a request, did you just go and do it once or did you set up a program for continual monitoring - once you become aware that this plant is involved with the use of asbestos or asbestos products?

Or does that depend on the request?

25 A. No, no. I think that's a very valid question.

It will depend on what we found the first time. If we found that the levels are high, and if we found that corrective measures are necessary, then we will continue following it up until we are satisfied that the actions have been taken.

30 Q. What does a request look like? Does it come on a...is it a memo, a piece of paper, written down?

A. Yes, it is written down. It's a piece of



5 A. (cont'd.) paper, it's a form approved in consultation with us, and that form would indicate the company's name, priority it is required, what other things are there other than asbestos - for example, that's the example you are taking, so if we go there, what we should expect, what instruments, you know.

10 Q. All right. So you would...let me just follow it through a little bit...you would get a request to go to a place and you are aware that it is an asbestos user. Now, prior to going would you notify the management that you are coming?

A. No.

Q. You never notify management when you are coming?

15 A. Never.

Q. So you just arrive there one day and announce yourself?

A. Yes.

Q. To management?

A. Yes.

20 Q. And what about to the union or to the workers who are there? Is there...

A. As soon as we announce, then we say we would like to meet the union rep or the health and safety rep, these days.

25 DR. DUPRE: That is at present that you do this?

THE WITNESS: The health and safety rep.

DR. DUPRE: Right.

THE WITNESS: But the union rep, we have been asking for a number of years.

30 DR. DUPRE: I see. So since 1978, you ask for...

THE WITNESS: Health and safety rep, or...

DR. DUPRE: Health and safety rep. Prior to that,





DR. DUPRE: (cont'd.) you were asking for the union rep?

5 THE WITNESS: Yes, Mr. Chairman. If I could backtrack a bit, we would...I guess obviously the question will start - have you got a health and safety committee, and then you ask for health and safety rep.

10 MR. STARKMAN: Q. Sorry, Mr. Lederer was talking there. As I understand it, you ask for the health and safety rep now when you go to...

THE WITNESS: A. Yes.

Q. ..a plant, and so you meet with the people, with the management as well, and then you take some readings. Would that be correct?

15 A. Yes, we will take some readings, we will review the process, we will take the readings, and we will come back and would ask for further meeting with the management and the union rep, and explain to them what our preliminary findings have been and what followup they can expect.

20 Q. I guess you make up...you have a formal report from these...

A. Yes. We have a very detailed technical report on each visit.

Q. What happens to those detailed technical reports when they are completed?

25 A. As soon as our reports are finished, copies go to the respect plants immediately.

Q. That's to the health and safety committee as well, or just to the management?

30 A. I think it's just to the management...and a copy goes to the line branch with the suggestion, which is in the report, to issue directions, if required, as soon as possible.

Q. Who do you send that to, I'm sorry?



A. To the line branches where the request came from.

Q. Now, you started to say before, if your assessment was that the conditions there were bad, then you would follow that up on your own initiative?

A. Yes.

Q. What would that involve, going back for a second and a third time?

A. That's right. And it could involve longer sampling periods, it could involve a lot of things.

Q. But if the conditions are reasonable, as you find them, then you wouldn't go back?

A. It's difficult to define reasonable there. Each hygienist uses his own professional expertise to see what reasonable should mean.

As you can appreciate, it takes a lot of experience and expertise to decide. His judgement could be very crucial in some cases, so I would say that unless he is solidly sure that the condition is safe, considering the current standard and everything else, he may decide to follow it up.

Q. This is left to the, basically to the discretion of the individual hygienist?

A. Exactly.

Q. Now, the report, particularly if the conditions are bad, who is the person you send them to?

A. As I stated, copies go to the companies as well as to the line branches, because it's their inspectors who go and issue orders.

Q. But is there any one person at the line branch that you send them to?

A. Yes. Copies go to the director of the branch,



A. (cont'd.) and they get distributed in the regional offices.

5 Q. Now, what about the inspection of construction sites or removal of asbestos, how is...

DR. DUPRE: Would you permit a question before we go to nonfixed places?

MR. STARKMAN: Certainly.

10 DR. DUPRE: I've been listening to this with great interest, Mr. Rajhans. I was just wondering if you could put it in the context of that J-M Scarborough plant, in the following sense, that I take it, of course, from the table that you have shown us this morning, that there was evidence of some high exposure records there in the early years. I know that you don't phase-into the situation until 1968, but bearing in mind  
15 the kind of general description which you so helpfully provided in response to Mr. Starkman's question, could I ask the manner in which your service remained involved in the time that you were there, with the Scarborough plant? Was this in continuous response to the requests from the line branch, or was it a  
20 continuing mandate that had you in there taking your measurements?

THE WITNESS: I would say both.

DR. DUPRE: Both?

THE WITNESS: Both, because that has worked that way, that at times the request was delayed, we would not wait, we would go in. So I have to say both.

25 DR. DUPRE: Okay. And then in all instances your reports concerning that plant would be forwarded to the company hygienists and to the line branch?

THE WITNESS: It may not be company hygienists. I think we try to find senior management and send to him, and  
30 to the line branches - yes, you are right - simultaneously.

DR. DUPRE: And to the line branch. And this kind





5 DR. DUPRE: (cont'd.) of modus operandi that you are describing for me here would be an accurate description of what went on until the plant went out of the A-C pipe business?

THE WITNESS: Yes, I would think so. Yes.

DR. DUPRE: Thank you, Mr. Starkman.

10 MR. STARKMAN: Q. I guess one more question on that before I move on is, you said you would review the samples taken by the various companies. I assume you do that when you actually visit the plant, but is there any ongoing review? Do you receive samples from, for example, asbestos manufacturers, on a regular basis, and review them?

15 THE WITNESS: A. No. We don't have any mechanism at this time in place which will facilitate that kind of review. If you recall, we were talking this morning about Johns-Manville plant. That's one plant which had been sending the results to us and we have been reviewing and commenting on them, and I do not recall any other plant being in the same situation.

20 Q. In your opinion, would it be beneficial to the work of your service to be in receipt of those samples on a regular basis?

25 A. It's a difficult question to answer, and I'll tell you why. The more data you get...it's too logical to argue it will be beneficial...but what it boils down to is, you need the staff, then, to review, you need them to store, you need them to...you know, there are all kinds of things involved with it and unless that mechanism is available, it may be an ideal thing, I would be skeptical.

30 Q. From your comments I get the impression that you feel that your service is understaffed, at the present time, or at least if not in staff, at least the budget isn't sufficiently large to do everything which it might do or could do if its budget was larger?



A. It's a very tempting question to answer, as you realize. You know, one being a bureaucrat.

Let me put it this way, that I think we are sufficiently staffed if we have to look after the requests, only the requests, from industrial health and construction safety branch. I have no problems in doing that. We are behind, our backlog is...I mean, if you look at our backlog it may look horrifying, but I think we can do it.

Q. What would the backlog be at any given time? Let's take right now. If you received a request that wasn't Triple X, top priority, what would the backlog be for a hygienist to go and inspect the workshop?

A. If it is not Triple X..and I wouldn't go into what is Triple X and Double X...I would say that it would be six or eight weeks, if it is not top priority.

But let me go on with the understaffing thing, because that should not remain unanswered, unless people get the wrong impression.

I think we can look after the requests, both high-priority and low-priority requests, but yes, if we are given additional responsibilities of doing a lot of things on our own...which appears to be coming out in this testimony...then yes, we will be considered grossly understaffed.

DR. DUPRE: To put it in yet another way, if on some Tuesday morning you suddenly come into your office with the feeling as the chief that, gee, on the basis of what I know has been going on in area X, it would be a wonderful thing if we could put a little bit of time into doing a little work of our own here, that at the moment is where your staff and resources don't permit that kind of an issue?

THE WITNESS: Yes, Mr. Chairman. I would say so.

DR. DUPRE: I see.



MR. STARKMAN: Q. I would like to move on to nonfixed work sites, construction sites and demolition sites, or the removal of, in particular asbestos, because that's what we are here to talk about.

Can you tell us how the monitoring is done, or if any monitoring is done, air sampling, at a construction site?

THE WITNESS: A. There are several types of asbestos exposures on construction sites. It is very easy to monitor if removing asbestos insulation. In other words, if that is involved, it takes more than a day, so monitoring and good long-term monitoring, is possible.

If the construction involves very short-duration of exposure like, let's say, taking apart just a few feet of insulation or lagging certain steam pipes in about five minutes or ten minutes, and somebody is anxious to know...or taking apart a transformer or something of that nature, which may not last for too long, I would say monitoring in the sense that you think, like sampling, is not always possible.

So one goes there, looks at the situation and tries to visualize or estimate what the exposure could be and what control measures are necessary.

The first thing one does is, rather than erring at all, ask for the personal protection right away if there is any element or any reason to believe that there could be an exposure to asbestos.

These two situations we run into quite often, but we do have monitoring data from the construction site where an operation involves longer period of time.

Q. Would you prepare the same type of report when you went to a construction site as you do when you go to a manufacturing plant?

A. The type and format of the report does not



A. (cont'd.) change, no.

Q. And that goes to...who do those reports go to?

5 A. The reports in this case will go to the director of the construction health and safety branch, who in turn will send it to the area in this case, administrators or something of that nature.

Q. And one goes to the employer?

10 A. One goes to the contractor or employer who is on the site.

Q. Do you...in the years that you have been involved in this work, do you actually inspect a great number of construction sites, or in your opinion is the number rather low compared to the number of plants...

15 A. I would say if you compare with the industrial establishments, obviously they are low. But I have visited quite a few of them.

But it's low in comparison..

20 Q. Do you ever send any of the reports to the Workmen's Compensation Board, in cases of...let's say you find that the conditions are very bad or bad, not acceptable, would you send that report to the Workmen's Compensation Board?

A. No, I don't think we will, as a rule. But I recall several cases in the past when the WCB had requested reports, and then we will send the reports to them.

25 Q. Would that be...you said several times in the past...would that be a regular occurrence, or do you just recall several?

A. No, several. No, it's not a regular occurrence.

30 Q. Do you ever..does the Workmen's Compensation Board ever consult with your service concerning various claims that they are adjudicating?





5 A. Yes, they do. In fact, if you look at some of the known plants, in the compensation cases that they have regularly consulted us, me in particular, and I have sent them, in writing, my opinion.

Q. What sort of opinion would they be seeking?

A. Basically what the exposure records have been in the plant for that operation, and what my interpretations of those exposure records are.

10 Q. When you send that report to the Workmen's Compensation Board, would copies go to anyone else?

A. No, except to my immediate superior. I would not think they go anywhere else.

Q. You don't send one to the claimant, for example?

15 A. No.

Q. You don't send one to the union, if there is a union?

A. No, not that I recall.

20 Q. And who is your...sorry, maybe you've answered this...but who is your immediate supervisor who you send a copy of that to?

A. The director of the branch, Dr. Pelmear, whoever happens to be my superior at that time, he automatically gets a copy.

25 Q. How many of those reports would you do for the Workmen's Compensation Board, on average, in a year?

A. Not that many. I can't give you the number offhand.

Q. Well, I mean, are we talking two or three, or...

A. Yeah.

30 Q. ...ten or twenty, or...

A. I would say not more than half a dozen a year.



5 Q. When you were talking this morning, you mentioned that at various places that your service had there some input into policy decisions. I think it was particularly in respect of your saying that you would be consulted with respect to monitoring and the feasibility of doing certain types of monitoring.

10 I am interested in what input you would have into policy. That would be at a formal level, or just in informal conversation with the people that you work with?

15 A. Both, I would say. As far as the policies regarding industrial hygiene, occupational hygiene for that matter, both formal and informal consultation is made before... that is, within the division of the ministry, occupational health and safety division...which I and my service get involved in.

20 Q. Well, for example, we understand that a standard for asbestos is now under consideration, there has been a proposal or a draft proposal put forward. At what level, or where would you have inputted into the development of that policy or that standard?

A. Right from the very beginning I have been involved in that, my service, I should say, have been involved.

Q. What form would that involvement take?

25 A. I would say intradivisional committee is always there. From various branches there are reps on that committee, deliberating the various aspects of the regulation, including codes.

Q. What committee are we talking about?

30 A. These are ad hoc committees, frankly speaking. These are ad hoc committees or ad hoc meetings that take place, and I think each branch has its own representative deliberating the regulations and standard setting.



5 Q. Well, for example with the asbestos standard, there was a committee struck in the occupational health and safety branch? Is that the type of thing you are referring to?

A. I don't know if you can call it a committee, but a group of people, consistently the same group of people from various branches, met regularly and provided the...

10 DR. DUPRE: From various branches, and not necessarily exclusively from the occupational health and safety branch?

THE WITNESS: No, no. From the various...each branch had its own rep on it, representative, because each branch had something to contribute.

15 MR. STARKMAN: Q. So it's in that way that you would input into, say, the asbestos standard?

THE WITNESS: A. Yes.

Q. Would you have any other types of input into the standard, other than this participation in committee?

A. I don't recall any other input, because everything comes out during those deliberations.

20 MR. STARKMAN: I have no further questions.

DR. DUPRE: Thank you.

Miss Jolley?

MISS JOLLEY: Thank you.

CROSS-EXAMINATION BY MISS JOLLEY

25 Q. I would like to know if there is any crocidolite used in Ontario right now.

A. It's a difficult question to answer. I don't think so, I don't think they have...I think at this moment I do not recall any industry still using crocidolite, but I can be wrong because in order to be a hundred percent accurate on it,  
30 you've got to go back and review each plant that you had visited





A. (cont'd.) before - using crocidolite.

So...

Q. But if there is any at all, it's a very, very  
5 minute amount?

A. Hopefully it is, since as you know it would  
be crazy, because they can't meet the standard.

Q. So essentially, the standard of zero point  
two fibers is creating essentially a ban in Ontario, is it?

A. I would think so. Unless they come up with...

Q. Is that the intention of the government?

A. I think...no, no. I don't think you can put  
that word into me.

Q. I'm sorry to hear that.

A. I don't...I wouldn't like to comment on the  
15 banning type of thing, because that could become a political  
thing. But I would say so restrictive that unless they equip  
each and every worker exposed to crocidolite with a space suit  
of some kind, essentially they have to eliminate it.

DR. DUPRE: I take it on that, of course, Mr.  
Rajhans, but I suppose I have to take what you have just said  
20 in the context of the new regulatory system, is that right?  
Because, as I understand it, we have had a guideline for  
crocidolite of point two fibers since 1975, which guideline,  
I gather, co-existed with, of course, some continuing use of  
crocidolite in the A-C pipe plant, correct?

25 THE WITNESS: Yes.

DR. DUPRE: So that to the extent that at this  
juncture it is your professional opinion that a point two fiber  
standard will, in essence, play a major role in reducing  
crocidolite, this professional judgement of yours must be based  
30 on the extent to which the monitoring of levels will indeed  
ensure that a point two fiber standard is effective?



DR. DUPRE: (cont'd.) Is that correct?

THE WITNESS: Since 1975?

5 DR. DUPRE: No. The statement that you just made, I gather, in answer to Miss Jolley's question, is a statement that has to do with point two - if it is promulgated as point two under the Designated Substance Regulations that of course can only come about as a result of legislation that has been in place since 1978?

10 THE WITNESS: Yes.

DR. DUPRE: Okay.

MISS JOLLEY: I would just like to go back to the guideline of one fiber and introduce, if it's all right with you, Mr. Commissioner, the June 20th, 1974, memos from 15 Mr. Rajhans, concerning Johns-Manville. I didn't make very many copies because I didn't want to misuse your facilities, but...

DR. DUPRE: Do we need an appropriate exhibit number for those, counsel?

MISS JOLLEY: I have a number of them. Would 20 they all go together?

MR. LASKIN: Well...all right. Let's get things in order here. Let's call the xerox copy of the first projection that Mr. Rajhans put up, called the Asbestos Standard Occupational, let's call that tab twelve, exhibit fifty-eight, and then in anticipation of getting a copy of that chart from the slide 25 on the Johns-Manville dust levels, we'll call that tab thirteen.

That leaves you, Linda, with tab fourteen.

MISS JOLLEY: All right.

DR. DUPRE: Thank you.

MR. LASKIN: Which is a Ministry of Health, 30 occupational health protection branch, field visit report dated June 20, 1974.



EXHIBIT #58, TAB 12: The abovementioned document was then produced and marked.

EXHIBIT #58, TAB 13: The abovementioned document was then produced and marked.

EXHIBIT #58, TAB 14: The abovementioned document was then produced and marked.

MISS JOLLEY: I just xeroxed the front page so that we were sure exactly how to identify it, and then page four, and I would like to draw your attention to page four, comment number six towards the bottom of the page on page four.

It says there that,

"Mr. Nelson, in his memo dated May 24, 1974, has suggested a TLV of four million particles per cubic foot for mixed dust," as compared to the eight that we saw on the slide,

"...and one fiber per cubic centimeter for asbestos fibers, based on recent changes in silicia, asbestos and nuisance dust TLV's."

I'm sorry, I didn't xerox table two, but I will make this available to the Commission afterwards.

I wonder if you could clarify to us exactly what this was, because you are indicated clearly to the branch and to the company that one fiber per cubic centimeter was a suggested level, and I don't understand what guidelines are, then, and what the guidelines exactly was.

THE WITNESS: A. In the absence of Mr. Nelson's memo of that time...

Q. I'm sorry, I don't have that memo.

A. ...I'm afraid it is not easy for me to



A. (cont'd.) recollect as to what happened exactly.

5 I have to go back and read that memo, in all honesty, to see why I agreed with him. Not because he was my boss, but there must be a reason.

Q. It's of some concern to us, because throughout the measurements around Johns-Manville and at other places, the one fiber was consistently used after 1974. I think it's slightly confusing.

10 A. Yes. I do have, excuse me, I do have table two with me. I just found a copy of the report, so in case you want it I can give you a copy right now.

Looking at table two, you will find that I have compared the levels with both two and one. I have given existing two, and proposed one. Why it happened again, Mr. Nelson's

15 memo may clarify it.

Q. You also, on that page four, drew the attention that only five counts are considered to be truly safe, out of twenty-two, at the bottom of the third paragraph in number six, and that was clearly comparing it to one fiber per cubic

20 centimeter as opposed to two.

A. It could have been. I think a more clear picture can be obtained from the table, because the table, fortunately, gives the last column as a normalized value, and in that it is fiber concentration divided by TLV, so anything

25 above one, using two or above...using either...could be gleaned from that table very readily.

Q. The next one I would like to introduce is a question about the forty-hour...oh, I'm sorry.

30 DR. DUPRE: If you please, just before you introduce that Miss Jolley, I just want to understand something here.





DR. DUPRE: (cont'd.) This memo, which is a memo, I gather, of which you are the author, Mr. Rajhans?

THE WITNESS: Yes, sir.

DR. DUPRE: Would, in essence, be typical of the kinds of field visit reports which I believe you told us your branch duly communicates both to the company and to the line branch. Is that correct? Is this an example of the kind of report you were talking about, because it's headed 'field visit report'?

THE WITNESS: Yes. I would say yes.

DR. DUPRE: Okay.

THE WITNESS: But it may not be typical for all these plants, because depending on the size of the plant the content may be less or more, but the format would be the same.

DR. DUPRE: And I understand that the lines of communication would be the same?

THE WITNESS: Yes.

DR. DUPRE: It would have been circulated to the company and to the line branch.

THE WITNESS: Yes.

DR. DUPRE: Now, can I take it at this point that this would explain why, on page four in the second paragraph under point six, you express surprise that the union indicated that the company had no knowledge of the two fiber TLV, because you go on to say that your last report was dated April 5, 1973, and accordingly if that report had followed the routing that you described as characteristic of all of your branch's reports, one copy would have gone to the company and another copy would have gone to the line branch?

THE WITNESS: Yes, sir.

DR. DUPRE: Okay.

Thank you, Miss Jolley.



MISS JOLLEY: Another exhibit. The next one, fifteen?

MR. LASKIN: Fifteen.

EXHIBIT #58, TAB 15: The abovementioned document was then produced and marked.

MISS JOLLEY: Q. This is just to deal with the issue of the forty-eight hours, and it's from a Mr. S. Morton, and it's the Ontario Department of Health, Occupational Health Laboratories, and it's, again, air sampling for Johns-Manville, and was Mr. S. Morton on your staff, Mr. Rajhans?

THE WITNESS: A. Hmmm...in 1974, we worked together, but I think no, you cannot say strictly that he was on my staff, but he was with the same service.

No, no. I take it back. Sorry. He was stationed in the lab, so actually he was under the lab, not even under the hygiene service.

So, no. He was working independently in the sense that his supervisor was different from my supervisor.

Q. But he would have been responding as well to a request to go into Johns-Manville, would he, then?

A. Yes. We would request him and he will go with his technicians or himself to do the sampling, yes.

Q. Right.

And was it my understanding that those technicians have moved to your service since then, from the lab?

A. Yes. They had moved in 1975 or 1976, to my service, but about a year ago there was a further reorganization and now they are moved back to the lab...not in the sense that they are physically moved back - they are still stationed in the regional offices, but are reporting to the chief of the lab, not to me.

Q. Just before I pursue this memo, can I ask,



Q. (cont'd.) they report to the chief of the lab, which is Dr. Nazair?

A. Nazaar. (phonetic)

Q. Nazaar?

A. Yes.

Q. Sorry. And what connection between the technicians and your service is there now?

A. I think the connection hasn't really changed that much except that there are two supervisors there, and there were some valid reasons to do that. But I would say the communication has remained practically the same, because my hygienists are stationed in the regional office, so are they. So any time the hygienist wishes, he goes and gets the help of a technician without too much problem.

Q. But they would be essentially, for example in 1974 when they were in the lab, they would be essentially measuring according to the TLV's set by your department?

A. Yes, with some further explanation there, that they will sample according to our instructions and according to our guidelines. As far as the TLV is concerned, that comes after the sampling when results are compared, so the comments will always be written by us. Yes, you are right.

Q. Well, comment number three in the notes here; "Threshold limit value listed by the ACGIH are based on a forty-hour work week. However, at this plant the average work week is forty-eight hours, with some men working longer shifts than this. The TLV's, therefore, should be corrected for this factor."

Are they out on their own in making that statement, or was that generally acceptable?

A. I would say in this case, if I recall correctly,





5 A. (cont'd.) what happened is that Mr. Morton is a scientist, or you can call him almost like an air sampling specialist - he was a professional, and he was giving his views as a professional, as an expert on air sampling, as to what should be done and what should not be done.

10 The memo, I guess, went to the people shown here, and further discussion on this would ensure as to see whether he is right or not. But this was his opinion and I guess further discussions were needed.

Q. Well, was it the practice then to apply a forty-eight hour TLV to Johns-Manville?

A. I'm to recall...

Q. Certainly it was a union request all the way through.

15 A. I'm trying very hard to recall what decision we took. I must say that I don't have all the facts in front of me to tell you exactly whether we followed his recommendation or we decided otherwise. So I can't tell you exactly what happened.

20 Q. I wonder if I could pursue your relationship with the mines, the Department of Natural...sorry.

DR. UFFEN: Before you start on it, could I ask a specific question about this latter one, the last thing, before we leave it?

25 There is an interesting point. Near the middle of it, it talks about the sampling techniques, how close you could get to the operator to make measurements.

Do you see item four?

"Using this method, samples were taken as close as possible to the operator of a machine, but it was never possible to obtain a breathing-zone sample over an extended period of time".

30 That's one thing I wanted to ask you about, what breathing-zone



DR. UFFEN: (cont'd.) sample means.

Then the next thing, the following paragraph:

"It would appear from this present survey that dust concentrations are much higher near the machine, and that this dust concentration decreases with increasing distance from the machine."

My second question is, does anybody know how that concentration falls off with distance?

THE WITNESS: In response to your first question, Greenberg/Smith impinger...and I have a picture here if you want to see it...

DR. UFFEN: You've got one in your textbook here.

THE WITNESS: Yes, that's right.

And you weigh the Greenberg/Smith impinger, if you can visualize, can never be put on anybody's lapel or around his neck, so it cannot be construed as a breathing-zone sampler. It was an area sampler.

In other words, you have to fix that instrument somewhere as close to the breathing zone as possible, because it has to be stationary somewhere, and try to take the samples which in turn will represent the breathing-zone concentration as much as possible.

So that's the reason he is talking about that it is not possible, and you just attempt to go as close to the breathing zone as possible.

Now, the second question is very difficult, because really nobody has been able to find...it does not follow any particular equation because of the various variables involved in it. It would be nice if we could come up with an equation like inverse square law, something of that nature.

DR. UFFEN: It would be more like inverse cube,



DR. UFFEN: (cont'd.) though, wouldn't it?

The volume is proportional to the radius, or...?

THE WITNESS: I wish I could be that...

DR. UFFEN: Whatever it is..

THE WITNESS: ...bold to say anything like that, because, Dr. Uffen, there's so many things involved in it that I think one has to practically sit down...

DR. UFFEN: Let me put it this way, would you expect it to fall off, or would it have been observed to fall off with distance faster than linearly?

THE WITNESS: I don't know if it would be faster in some cases, in may not be faster in all cases. Sometimes it may be slower, depending on how many sources of dust are in that plant, but yes, if you take one dust source and there is no other dust source in the plant, and turbulence is kept minimal, then perhaps you are right, it will be faster.

DR. UFFEN: So if you make a mistake of a foot or so, close in, the distortion to the result may be very much more considerable than a foot or so somewhere else, error?

THE WITNESS: Yes. Providing what I said is applicable. You cannot have one general rule which would apply to each situation.

DR. UFFEN: Just that if you are farther away the measurement would be smaller than the man's inhaling?

THE WITNESS: Exactly. That's for sure.

DR. UFFEN: So the measurement may be quite wrong?

THE WITNESS: If you are too far. But then again, there are ways...the way we did in the past, when we did not have miniature type of samplers that can be placed very close or on the lapel, we tried to take several traverse, if you want to call it, type of samples - it was put at various places, to get the average work exposure in that area.



DR. UFFEN: That's what worries me. You take them all over the place and then take the average, and the variation as you approach the subject is not linear?

THE WITNESS: No. But that was the state of the art.

DR. UFFEN: One more reason why the measurements a few years ago have to be taken with a grain of salt.

THE WITNESS: Taken with a grain of salt. Right.

DR. DUPRE: Please proceed, Miss Jolley.

MISS JOLLEY: Yes.

MISS JOLLEY: Q. Your consultation role with the department of the mines engineering branch of the Ministry of Natural Resources, before the consolidation, while you indicated to us that they in fact have an industrial hygiene component themselves, you did in fact take measurements in the mines in northern Ontario, didn't you?

THE WITNESS: A. Yes. I should correct myself when I was telling about them having their own component, this came about quite recently. Quite recently...maybe after 1976, I don't recall exactly the date. But prior to that, we were there consulting hygienists as with the industrial and construction.

Q. Right.

I would like to remind you of the Reeves Mine, just outside of Timmins.

A. Yes.

Q. It was a Johns-Manville mine?

A. Yes.

Q. And you took readings in 1969, and I would like to introduce a field report from 1972, September 6th...sorry. I know this is historical, but I would just like to ask you a question.





MR. LASKIN: Sixteen.

DR. DUPRE: Sixteen, did you say, counsel?

MR. LASKIN: Just for the record, it's a field  
5 visit report dated September 6, 1972, from Mr. Rajhans.

EXHIBIT #58, TAB 16: The abovementioned document  
was then produced and marked.

MISS JOLLEY: Q. I think the concern that we  
have, and understandably as I can present it, is that the  
10 consulting role is you offer a report such as this one, to the  
field, the line supervision. You had no authority to issue  
directives, is that correct?

THE WITNESS: A. Yes, correct.

Q. Right. So that presumably the mines  
15 engineering branch in the Ministry of Natural Resources should  
have or would have issued the directives based on this report?

A. Yes. They should have.

Q. Can I draw your attention to the third page,  
section two...this was 1972, and you were drawing attention to  
the mines engineering branch that the TLV had in fact been  
20 lowered to two fibers per cubic centimeter...in section two.

A. Yes.

Q. Was it your memory that they understood  
that, in future measurements, etc.?

MR. LEDERER: Just a minute before you answer  
the question, Mr. Rajhans.

I just wonder if I could raise a concern about  
all this. I'm not sure that...it's only because of my recent  
entry into this affair that I'm even in a position to object  
to the question...but as I sit and listen to these questions  
I am becoming increasingly concerned about what the point is.  
30 This is a memo that is ten years old. I can understand that  
the history of the way in which the treatment of asbestos has



5 MR. LEDERER: (cont'd.) been conducted in this province may be of significance to this Commission so that you can come to some understanding how it is that we progressed to today's data, the position that we are today, but to ask this man questions about things he knew or judgements that were made about a particular case ten years ago, seems to me to be of very little assistance and frankly...and I can't say this is the case, but I can only assume that the reason for doing it is to attempt to in some way embarrass somebody, and as I say, I'm not objecting to the question, I'm not sure I'm in a position to do so, but I raise what I think is a very serious and legitimate concern about just how deep and how far these ten year old questions should really go.

15 This last one, as I say, is a very particular question about a very particular judgement.

MISS JOLLEY: I think my concern, Mr. Chairman, is that the role still remains to be a consulting one, and is the same thing happening.

20 MR. LEDERER: Well, the question...the legislation has fundamentally changed. There have been huge steps taken since those days, and let's talk about today. Let's not draw some conclusions about today from something that is ten years old.

That is precisely what I think is unfair.

DR. DUPRE: Give us a moment, please.

25 (REPORTER'S NOTE: At this point the Commissioners conferred among themselves.)

30 DR. DUPRE: Okay. Mr. Lederer, as far as your... and I thank you for alerting us to your concern...having done this much, I also wish to point out that the relationship between the occupational health hygiene service and the inspectional branches to which it provides consulting services is very, very



5 DR. DUPRE: (cont'd.) material to our examination of the situation, and so for that matter, is the relationship of that service to the mining branch, which our testimony at the moment, of course, does point out is not somewhat different from the relationship of the other two branches.

10 So my colleague and I are certainly disposed to permit this line of questioning to continue at this point, insofar as the current relationships do very much, as we understand it, have a grounding in historical developments.

So, Miss Jolley, I do invite you to proceed, always bearing in mind, of course, that we are policy analysts rather than historians, but history does have its appropriate place here.

15 So, please continue.

MISS JOLLEY: Thank you, Mr. Chairman.

MISS JOLLEY: Q. I think I was pursuing the issue that you had indicated, that the Ministry of Health had established a TLV for asbestos, which you indicated historically, in 1972, and in this recommendation dated in 1972, you were  
20 indicating that change.

Was it your experience that they understood that change, in the mines branch?

25 THE WITNESS: A. I have no reason to believe they didn't. Again, I am going by my memory. It has been ten years and I have to say that there is no reason for me to believe they did not.

Q. I do have documents here dated in 1975, when the Honorable Frank Miller informed Leo Bernier yet again that the level was two fibers per cubic centimeter, that came out of the Matachewan experience.

30 I wonder if I could introduce those?

DR. DUPRE: Yes.





DR. DUPRE: (cont'd.) While you are introducing that, Miss Jolley, could I ask our witness the following question:  
5 We have established that at present there is a relationship between your branch and the mining branch of the Ministry of Labour, that continues to be different from the relationship that you have to the industrial/construction branches.

May I ask you the following: If it became a matter, for example, of opening a new asbestos mine in Ontario,  
10 or reopening a mine that has since been closed, is your organizational place in the Ministry of Labour such that you would be likely to be brought in for a measurement function, or is it instead the case that given the organization of the mining branch it would be the mining branch that would be  
15 looking at the kinds of measurements that would be needed to make a determination as to whether a new mine might be opened or an existing mine might be reopened?

THE WITNESS: I think it will be the mining health and safety branch hygienists.

DR. DUPRE: It would be that branch?

20 THE WITNESS: We will not be, in my opinion, involved.

DR. DUPRE: Thank you.

Proceed, Miss Jolley, please.

MISS JOLLEY: Q. May I draw your attention  
25 back to page four of your field report, and the conclusion. Again, the conclusion is an extremely strong one in which you said that, "There had been no improvement in the dust conditions since the last visit in 1969. In fact, the conditions had become worse. There appeared to be no concern among the company's officials about the deteriorating dust conditions...  
30 it's pretty obvious from the poor maintenance



MISS JOLLEY: Q. (cont'd.) of the exhaust system. It is my feeling that if the condition is allowed to continue it would not be too long before a case of asbestos disease would develop".

Then you go on to say:

"All the recommendations of my previous report, dated April 21, 1969, still apply"...and this was a report dated August 27th, 1972. I recognize that it was ten years ago, but it is again of concern that your recommendations aren't always followed by the field personnel.

THE WITNESS: A. What is the question? Sorry.

Q. Well, I think my concern was, do you know what happened at the Reeves Mine after 1972? Did you go back after 1972?

A. It's getting to be very difficult to remember. I don't know. I can't tell you offhand. I have to go back and check.

If I did, I don't know when they closed. I'm at a very disadvantageous position. I'm sorry, I can't give you exact account of what happened after this.

As a matter of fact, when I read this report, you know, there are a lot of things that I didn't remember that I had written, so I can't say.

Q. It's of concern to us because the plant, in fact, went downhill to be closed with readings of two hundred and twenty-five fibers per cubic centimeter.

DR. DUPRE: Just before we leave this, can I understand one thing, which is, that your branch's involvement in that mine back in 1972, which is what this documentation deals with, would have been a relationship that would not have come about in the ordinary course of things, given what I take



DR. DUPRE: (cont'd.) it, even at that time, was the role of the mining branch in providing its own hygienic and measurement services? At that time?

THE WITNESS: At that...if they had it, maybe, you know...I can't comment on that.

DR. DUPRE: Okay.

MISS JOLLEY: Q. With your relationship with the mining branch, was it purely invitation that would draw you back into a mine, from the field personnel of the mine's engineering branch, or would it have been at your own...you indicated that you might continue to follow up, and I understand that that's what you did at Johns-Manville yourself, but in the mining branch was there sort of a separation that you would only be invited in?

THE WITNESS: A. No. As a matter of fact, if I recall correctly we had gone into various mines on our own ...in fact more often on our own than at request.

Q. Would you have gone into the Matachewan Mine when it first opened in September, on your own?

That's unfair to ask you, it's 1975.

A. I have to jog my memory. The strain is really to remember how we went there first. I can't recall. I have to go back in the file to see how that came about.

DR. DUPRE: Now, let me perhaps get us out of the history book at this point, at least by posing to you the following question: Now, today, can I take it, given my understanding of the organizational chart, that your branch would not be involved in taking measurements in a mine?

THE WITNESS: Yes.

DR. DUPRE: Can I take it further than insofar as measurements are made in a mine they would be made by hygienists who are in the mining branch?



THE WITNESS: Yes.

5 DR. DUPRE: May I further take it at this point that if you did become, by chance, involved in a mining situation under today's organization chart, you would wind up in there not at the request of mining inspectors, but because some mining branch hygienists simply wished to supplement their own technical expertise by having some colleagues from your branch become involved?

10 THE WITNESS: I suppose so. That could occur, you know.

DR. DUPRE: Okay.

MISS JOLLEY: Q. In the testimony that we...I'm moving to another subject...

15 THE WITNESS: A. Good, thank you.

Q. Let you off the hook.

In the testimony that we had from Dr. Vingilis a week and a half ago, he suggested that when they began at the chest x-ray division to see asbestosis cases at Johns-Manville, they reported that to your division, and I recognize that you weren't in charge of that division because he suggested that the first case that they saw, I think, was 1966...either 1964 or 1966...out of Johns-Manville, and that they reported that to you so that you would go into that plant to follow up that situation.

20 Did you have a close rapport with the chest division at Grosvenor? I mean the hygiene...

25 A. Yes. Personally I had very good rapport with Dr. Vingilis' boss at that time, Dr. Caul, and since I joined one of the things that I was told to do is that, I think it was every Tuesday, one morning...every Tuesday morning...I must spent with Dr. Caul and his group to review their findings about various silica and asbestos plants that they have surveyed





5 A. (cont'd.) in the last few weeks or days, so I would say that that continued for quite a while and I used to visit them very regular.

Q. Would some of the line branch of the industrial safety division be at those meetings as well?

A. No.

10 Q. No? So there was no...you were communication with the chest division, but then was there communication following your meeting, then, with the actual inspectors?

A. Yes. If we find anything that warrants or that required a hygiene visit, or a hygienist's visit, then we will phone the line branches to let them know that we intend to visit that plant and when we can go.

15 DR. DUPRE: May I be permitted here Miss Jolley? I would like to just set Miss Jolley's questions and your answers in my perspective of government organization, as it then was.

20 I take it that in the period over which she is asking her questions, of course your service was in the Ministry of Health?

THE WITNESS: Yes.

DR. DUPRE: Where also at that time could be found the occupational chest disease service? Or was the occupational chest disease service in labour?

25 THE WITNESS No, no. They were in the same ministry.

DR. DUPRE: They were in?

THE WITNESS: In the same ministry.

DR. DUPRE: They were in the Ministry of Health.

30 Now, with respect to Ms. Jolley's question about the involvement of the industrial branch and the construction safety branch, in what ministry were those branches?



THE WITNESS: They were in the Ministry of Labour.

DR. DUPRE: They were then found in the Ministry  
5 of Labour.

Now, can I take it from your answer to Ms. Jolley  
that notwithstanding the fact that in this period your branch  
and the chest disease branch, which were in one ministry, and  
on the other hand the inspection branches which were in labour,  
were in no way inhibited in terms of their communications with  
10 one another, by the fact that they were lodged in separate  
ministries?

THE WITNESS: Mr. Chairman, you obviously realize  
that I am not really the right person to answer that kind of  
question.

DR. DUPRE: But you were working the machinery.  
15 I'm not asking the question in the abstract, I'm just asking it  
to you in terms of your ease of...you would communicate directly,  
and not through your deputy minister, then to the other fellow's  
deputy minister, and then back down the tube?

THE WITNESS: No. I think, Mr. Chairman, if my  
20 recollection's right, it was a very informal relationship - I  
would pick up the phone, I wouldn't even go to my immediate  
supervisor. I would just pick up the phone and call the  
particular inspector.

At that time we were all centralized and I used  
to know the inspectors by their first names. It's becoming  
25 difficult now.

DR. DUPRE: Okay. So that's a very useful answer.  
Thank you.

Ms. Jolley, thank you for that.

MISS JOLLEY: Q. The proposed standard, the  
30 forty-hour work week, you suggested that a forty-hour work week  
was a better or more efficient way of doing it, that you were



Q. (cont'd.) producing more accurate and better information?

5 THE WITNESS: A. No. What I said is, that's what the ministry thinks or that's what the division thinks that for all chronic hazard, forty-hour work week is a better indication or index of health hazard.

Q. Are you differentiating your own opinion from that?

10 A. No, I didn't. I thought perhaps you meant I personally said that.

Q. No, no.

A. Oh, no. You are right. I just wanted to re-emphasize that that's what the ministry's view is and I obviously subscribe to it.

15 Q. For the asbestos time-weighted average, the suggested amount of time taken to monitor is six hours. Is that correct? Or less if you take representative samples?

20 A. Yes. I forget exactly the code, what the code says, but you have to realize one thing at this point, and that is that the asbestos also has a ceiling exposure, which is for fifteen minutes.

25 Now, the sampling has to be devised or planned in such a way that that fifteen minute exposure is accounted for as well as any forty-hour exposure, and that necessitates sequential sampling in a lot of cases, of shorter durations, so that that peak can be caught.

30 So in some cases it could be fifteen-minute sampling of about a hundred samples or something, sequential. However, if the prior knowledge is such that the peak will not be exceeded, then the exposure time could be extended and I think the code suggests six hours or something. I forget now. You are right in that respect.





Q. How can you ensure that they will sample during peak exposures?

5 A. It's very difficult to ensure in the first instance. However, if you do a simple calculation you will find invariably that if the time-weighted exposure has exceeded, the excursions have chances of exceeding the peak value. So you may not be able to catch in the first instance, but then a good hygienist will go back and resample on sequential basis so that he can catch the peak, whether it exceeded or not.

10 Q. Could you sample over a forty-hour work week?

A. If required we can, but that will have to be broken down, because as you know, sampling...or rather, let me backtrack...dust loading on the filter dictates, at times, and most of time of our asbestos sampling, the time of sampling because you can't use the same filter for forty hours. It will never be a good...let me take it back...providing the exposure is so low that forty hours won't matter, that the exposure is even in the range of one to two fibers per cc and you did it forty hours, you will overload the same filter, and then there are different ways of doing it - you can take different filters, you can take other kinds of samples.

20 Q. The last question I have is about personal protective equipment, and I wondered if you can suggest to us some of your reservations about personal protective equipment?

25 A. The reservations are obvious, as I guess most of the people know. Any protective equipment is good only if it is used properly, and if the close supervision is made in the sense that there is a good protective equipment program being followed in the company, which falls back on the internal responsibility system.

30 Without good, logical respirator selection program and respirator program, respirators will not remain effective.



5 Q. Is it your experience that the use of respirators has been carefully carried out in the Province of Ontario, in the past?

A. I would say the recent awareness and educational activities by various groups have helped to make the use of respirators much improved than it had been in the past.

10 Q. But you, nevertheless, have said on a number of occasions, and would still say, would you not, that the respirator is a last resort and should only be used as an interim measure?

A. I think that is the philosophy which is indicated in our proposed regulation, and we continue thinking that way.

15 MISS JOLLEY: Thank you.

DR. DUPRE: Just to followup of Ms. Jolley's last question, Mr. Rajhans, if I may draw your attention to tab number eight, on page thirty-four. There, under the heading Discussion and Conclusions, you have a number of comments about the best way that respiratory equipment can be introduced when necessary, and about the manner in which abuses of respiratory protection can be avoided.

20 Now, this is a paper, I gather, that was written oh, about four years ago, but basically are you satisfied that the kind of input which this paper was obviously meant to constitute is reflected in present and proposed regulations with respect to the use of respiratory equipment?

25 THE WITNESS: Yes. I will say it is. I think we have followed...or rather I should say we have practiced what we preached here.

DR. DUPRE: Thank you.

30 Mr. McCombie?



MR. McCOMBIE: Thank you.

CROSS-EXAMINATION BY MR. McCOMBIE

5 Q. I would like to go over some of the general things that came out in the testimony this morning, and then move on to some specifics.

10 First of all, if I understood it correctly when Mr. Laskin was asking you questions, you indicated that in your early days with the Ministry of...I guess then, Health, part of your function was to help locate plants where there was asbestos or silica exposure, is that correct?

15 A. Yes. To help inspect them. I did not really go and locate them, because they may have been on the list. But they may not have been visited by us, so I compiled those places which perhaps have the exposures but we do not have information on file.

Q. Where would you get the information on the exposures?

20 A. Okay. That was very easy, really, because knowing the uses of asbestos in this case, or the uses of silica, it's very easy to earmark those industries where you can expect exposure. It was not difficult.

25 Then you take the trade index and other index available in the market, and just go under, for example, friction materials.

Q. And this would have been something that your section would have been doing?

A. That's what we did, yes.

30 Q. I understand from the testimony that we heard a week and a half ago from Dr. Vingilis, the occupational chest disease section did a similar kind of attempt to locate. Presumably there was communication between, and comparing of



Q. (cont'd.) notes between, the two groups, was there?

5 A. Yes. In fact, we exchanged our notes and we complemented each other by picking some that I missed, and they picking some.

Q. So you would in that way attempt to correlate your lists, one with each other?

A. Yes.

10 Q. And once these plants were located and visited, presumably you would attempt to visit as many of the plants on these lists and possibly, and presumably give some kind of priority based on the amount of exposure. Would that be a fair statement?

A. After the initial visits, yes. On followups.

15 Q. Okay. I would like to touch on something else that you mentioned this morning, and that was the 1972 change to the two fiber standard or guideline. I believe you answered in response to the question of whether there was any input from labour or management, you seemed to indicate that it was a fairly unilateral decision on the part of the ministry, is that fair?

20 A. Yes.

25 Q. Could you tell us who, precisely...like, what different sections in the ministry would have been involved in this? You are with the Ministry of Health at that point. Presumably the Ministry of Labour would have been involved in some way?

A. Frankly speaking, there are only three, four people. We then sat down around the table and we decided we should go to two.

30 Q. I see.

DR. DUPRE: Just so I can understand one thing, though, about that two fiber guideline at that time, was that





DR. DUPRE: (cont'd.) a Ministry of Health guideline then, or was it a Ministry of Labour guideline?

5 THE WITNESS: It was a Ministry of Health guideline, but then as the process was, our recommendations became their guideline, too.

DR. DUPRE: Okay. Thank you.

MR. McCOMBIE: Q. This guideline was arrived at based on, in particular I gather, what was the ACGIH material, or the NIOSH material?

10 THE WITNESS: A. No...the NIOSH material, you are right. The NIOSH material plus the development in the European countries, that was going on. So it was not only the NIOSH material, and I think somewhere I just saw that in the Reeves Mine report, that indicated why we went to two.

15 I didn't realize that was put in there, that report, but it is documented also in this book why we went to two in 1972. Three or four reasons are given, and one of them is NIOSH documentation.

20 Q. Was there anything other than medical or scientific material used to arrive at that guideline? I mean, was there any economic analysis done, or study of the feasibility of plants meeting that?

A. No. We were very unscientific, if that's what you mean.

25 Q. I would just like to refer briefly to the first, tab one, of your compendium, and page eight of that particular document, and this was written in 1970, or it was a paper presented in 1970, and I just noticed under number one on the lefthand column, substitution, it states, quote:

30 "The only sure way to prevent asbestos disease is not to use asbestos". End quote.

Is that still your feeling?



5 A. It has to be looked at from two different points of view. If I meant 'sure' means to be always sure, I think that is still valid. There is no other 'sure' way and nobody can say for 'sure' that at certain levels no asbestos is indicted, including every, you know, carcinoma and other things.

But I think that will still be valid. For sure that's the only way you can say, that you eliminate.

10 But the second point of view that you should remember is that it was written more or less wearing my hat as a scientist in the sense that I was thinking at that time, my knowledge was limited on control measures. I wasn't as wise as I am now, so you must look at this from two angles.

15 Q. So you are saying now, with your increased knowledge in control measures, you are suggesting that you can control the use of asbestos to the point where it is almost the same as not having asbestos, not using it?

A. I would say that now my knowledge would suggest that you can control that at a much lower level than at that time I thought you could.

20 Q. Okay. I guess the point I was getting at there...you've indicated that in 1972 you were going strictly on scientific guidelines or medical guidelines, if you will, rather than economic or technologic ones, and you have indicated that the philosophy of the branch was, quote, 'to protect workers' health', and you have said that several times, and you have  
25 indicated in your writings in 1970 that the way to prevent asbestos disease is to not use asbestos, and it seems to me there must have been some tradeoff there that was made, and I'm wondering where in the process it was made...if you wrap those three ideas together.

30 A. I find myself very...in a difficult situation to answer that. I don't think there was any tradeoff. It will



A. (cont'd.) be, you know, as your knowledge expands you do change your views personally, and so...

5 Q. I'm certainly not trying to hold you to something that you wrote twelve years ago. I'm asking if you still believe this, and you have indicated that you believed that to be the case, that the less exposure to asbestos the better, but you feel that the control can be much easily achieved now than you did twelve years ago.

10 A. Yes.

Q. Now, to move on to some questions that Mr. Starkman asked earlier, in outlining I guess the structure of the branch as it existed before 1977, you indicated that if measurements were high, if you did a sampling and measurements were high, you would then follow up on further sampling, is that correct?

15 A. Yes.

Q. Would that be the case ever since you joined the branch in 1968?

20 A. I don't think I can take that kind of credit. I think that philosophy has been there...as I joined, I knew that that philosophy was prevalent.

Q. So from your understanding it was there ever since you have been employed with the branch?

A. Yes.

25 Q. And this was always the case, whenever there were high readings there would be a followup done?

A. To my knowledge. I think so.

Q. To your personal knowledge, anything you were involved with?

A. Yes.

30 Q. Now, you also indicated that...if I'm correct in summing this up...that a report would be done, would be sent to the employer and to the director of the line branch, and the





Q. (cont'd.) line branch would then issue directions if necessary, is that correct?

5 A. I think the first two parts are correct. The second one..the third one, they would issue orders if necessary, if it does not imply that they use their own discretion quite often then that would not be factual. On the health matters, usually our recommendations and suggestions are carried out verbatim, almost, so if we suggest orders, they go and issue orders.

10 Q. I see. So you would suggest to the line branch that perhaps there should be such-and-such an order issued and in most cases that would occur?

A. Again, you are right except the part 'perhaps'.

Q. It would always...?

15 A. We will not say perhaps. We will just say orders suggested to be issued, and that would imply that we are asking them to issue those orders. So there is no doubt in that.

Q. Perhaps it's quibbling over semantics, but you say suggested to be issued, which implies that...I just want to get clear the chain of responsibility here.

20 A. Okay. Now, I'm sorry, I didn't get you in the beginning, but now I'm clearer.

Yes. The word 'suggested' would indicate what you are saying, but the practice is that they issue all the directions that are under the 'suggested to be issued'. Suggestion does imply that they have the final authority, and they do, of  
25 issuing the order.

DR. DUPRE: I take it you would be using the term 'suggests' precisely because you are in a consulting relationship to the industrial branch, the construction branch, correct?

30 THE WITNESS: Exactly, Mr. Commissioner.

DR. DUPRE: And as a consultant you are making a suggestion?



THE WITNESS: Thank you, yes.

5 DR. DUPRE: In the last analysis, it is that individual branch that would make a decision consequent on your suggestion?

THE WITNESS: Yes.

10 MR. McCOMBIE: Q. Okay, to move on to some further questions that Mr. Starkman asked concerning the Workmen's Compensation Board, again you indicated to Mr. Starkman several times the Compensation Board has requested reports from your branch, is that correct?

THE WITNESS: A. Yes.

15 Q. And you would send reports to them, but you wouldn't send them to anyone else such as if there were a union involved, or to the claimant?

A. Yes.

Q. Have you ever had occasion to...

DR. DUPRE: Or for that matter, you wouldn't send it to a firm about which the WCB inquired either, would you?

THE WITNESS: Yes.

20 DR. DUPRE: Correct. So this was a straight communication with the WCB?

THE WITNESS: Yes.

25 MR. McCOMBIE: Q. Okay. If on the other hand you received a communication from a worker who had a claim at the Compensation Board and asked for any information you might have on his or her particular workplace, would you then give that worker a report? Or that worker's agent?

THE WITNESS: A. You mean in those times, if we did it?

30 Q. Have you ever received a communication from a worker or...

A. I have not. That's why I am at a loss. I



5 A. (cont'd.) don't know if I can answer your question precisely because I do not recall any situation when I got a request from a claimant. Personally, I don't recall any.

Q. Could you tell us that if you, let's say tomorrow you received a request, would it be just a formality to answer that or would you have to consult with someone and see whether you could answer it?

10 A. Things have changed and things are changing fast. I don't know what the freedom of information means.

I don't know. I would have to consult with my superiors to answer your question.

Q. Okay.

15 Speaking of changes, and I guess to some extent this follows up Mr. Lederer's comments earlier, and this is just a very broad and general question - obviously there have been a lot of changes in the last fourteen years that you have been involved in occupational health and safety with the government.

20 I am just wondering if you can...as I say, it's a very general question...but I am wondering if you can indicate I guess the direction that you have seen things move in the last, you know, in your stay with the ministry, with both ministries. I guess I'm thinking specifically of, we have had new legislation which has changed things and we've got regulations which are proposed or in place, but has the philosophy of the ministry changed any? Is there more openness to...for example, 25 you indicated earlier that you wouldn't necessarily contact the union or the health and safety committee in the earlier days as readily as you do now...I mean, do you see that kind of process opening up and the kind of information getting across to workers and unions more readily now?

30 A. Yes, I would say it has.

Q. Do you feel that the lack of that in the past has been...I mean, do you think that in hindsight, and we



Q. (cont'd.) can all say things quite clearly  
in hindsight...do you think that there was too much secretiveness  
in the ministry in the past?

A. I have very little opinion on that. It's  
very difficult to say things about the whole ministry. If you  
ask me personally..

Q. Personally speaking then?

A. Okay. If you ask me personally, I have been  
always very open with the union wherever I could recognize a  
union, but you may be correct in saying that times have changed  
and more openness is there.

Q. But that's not necessarily to comment on past  
practices?

A. It's very difficult for me to comment on the  
past practices. Things were different, I guess. In fact, the  
awareness amongst the workers and unions about health and safety  
matters, if I can comment on it, weren't as great at that time.  
People wouldn't...you almost had to force the union to listen to  
you about health and safety.

DR. DUPRE: Again let me, if I may, move you out  
of the history books to the present situation. We have had some  
descriptions of reports from your branch which are always to go  
to the field branch and to the company involved.

Now, for such reports is there any difference  
in the routing now? Are such reports routed to any other place?  
To a health/safety committee or to a union? Or to a health and  
safety representative?

THE WITNESS: As far as our service report  
distribution is concerned, I don't think that has changed. I  
can't comment on what the inspectors, what changes the inspectors  
have made in distributing our reports.

DR. DUPRE: That's the difference? Okay.





DR. DUPRE: (cont'd.) Thank you for clarifying that.

Mr. McCombie?

MR. McCOMBIE: Thank you.

MR. McCOMBIE: Q. I guess the reason I'm asking this, and I do realize that it is a fairly broad and general question, is that I'm sure you are aware that a lot of the criticisms that have arisen around occupational health and safety have been around the lack of information that workers have historically received, and I think Ms. Jolley pointed out several instances where that was the case, and it has been a general complaint that the workers are kept in the dark and I'm hoping if...I guess I'm asking if you see a movement towards a more open sharing with that.

THE WITNESS: A. My personal view is yes, that was quite evident from the public meetings that we held on various regulations. That should be indicative of the openness that we are going through.

Q. As opposed to the 1972 introduction of the two fiber limit, it was quite a change?

A. Yes, you can say that.

Q. I would just like to raise one more example, then, of the kind of concern that has been shown by labour on this, and I'm wondering if you were involved at all with the Bendix Corporation, Bendix Auto Corporation in Windsor, Ontario, and the situation there?

A. I think I was in the earlier days. I would have to go back and see the files, unless you have something readily available there that shows my report.

Q. Unfortunately, I don't have nearly the amount of documentation that Ms. Jolley had.

A. I think I was involved at one or two occasions.



A. (cont'd.) Considering it's an asbestos plant, it's quite likely I would.

5 Q. You have indicated that there was an attempt by both your section and the occupational chest disease section to list the users of asbestos and monitor them. I would hope that Bendix would be included in that group, and that there were visits made and where measurements indicated a high level, then followup visits would be made. That was your earlier testimony.

10 It has been indicated in a lot of the publicity surrounding the Bendix situation that orders were issued in 1966, and there was no followup until 1977. Particularly I am quoting from an article in the Windsor Star, dated January 24, 1980, in which a group in Windsor revealed a government memo that ordered Bendix to clean up asbestos in its Windsor plant in 1966, and then it goes to say that,

15 "It is alleged that there was no followup done and certainly no notification to the union involved until 1977," which is an eleven year period.

20 Do you remember any followup visits done? I guess 1966 is obviously before you started, but after you started were there any followup visits done, any orders issued, any suggestions made to the Bendix plant between that period and 1977?

25 A. Between 1966 and 1977?

Q. Yes.

A. What were the counts? Have you got the report there? What were the counts at that time?

Q. I'm afraid I don't have the report, no. I have one...

30 A. What I was thinking is that my statement should remain valid. If the counts were high, then they must



5 A. (cont'd.) have been followed up. I can't see that not being followed up. But if the counts were low, then I would say that that would get low priority, and I wouldn't be surprised if they were forgotten.

Q. Well, again to quote from the Windsor Star article, it says that:

10 "The memo says Bendix was ordered, in 1966, to stop all dry sweeping of asbestos. The same order was made again in 1970, but dry sweeping continued until 1977".

15 As I say, unfortunately I don't have copies of the readings, but I do have a copy of a report dated March 10, 1970, signed by Mr. Nelson, who I gather at that point was your superior?

A. That's right.

Q. Indicating that there certainly did seem to be some problems at the Bendix plant - in particular the cleaning of the collector bags. Quoting from the report, it says, quote:

20 "Cleaning of the collector bags is considered to be primitive and exposes a man unnecessarily to high dust levels". End quote.

I would assume that that would be sufficient to warrant further followups? But you can't remember any further followup visits you made subsequent to 1970?

25 A. I don't remember if any followup sampling was made, as I say. I have to go back and check what the levels were.

30 But I do recall visiting some time in 1976, that plant. But I don't recall for what purpose I visited, whether I took samples or I just visited to see work practices or observe some work practices.





Q. In observing work practices, presumably you would be looking at respirator equipment?

A. I should have been, yes.

Q. So you know if your branch would have been involved, I understand that the Bendix plant on Argyle Street in Windsor was dismantled and in fact torn down, I believe. Would your ministry have been involved in this, as it was in the dismantling of the J-M A-C pipe section?

A. I can't offer any opinion. I have to go and check, because my memory is not as vivid about Bendix dismantling as it is with Canadian Johns-Manville.

Q. So you can't remember any details of the...

A. No.

Q. ...Bendix situation.

MR. McCOMBIE: Okay. I have no further questions.

DR. DUPRE: Okay. Now, Mr. Lederer, perhaps before I turn it over to you I might point out that the Commission is prepared to sit until six-thirty this evening. Dr. Pelmeur has been in a holding pattern for some time, for which we apologize.

Please proceed then, Mr. Lederer.

CROSS-EXAMINATION BY MR. LEDERER

Q. Dr. Rajhans, I don't really recall who asked the original question, I think it may have been Mr. Starkman, but somebody asked you whether or not you had sufficient personnel or resources in your branch, as matters now stood, to deal with the problems that confronted you. Do you recall that series of questions?

A. Yes, that's right.

Q. I believe the Chairman, towards the end of that series of questions, asked you whether or not you could devote



5 Q. (cont'd.) time to a particular problem on a particular day. The implication of the questions that had gone before, and I think the Chairman's statement was, you might not be able to respond to that because all you can do is deal with, as I understand your evidence, all you can deal with are the particular referrals you get from the line branches.

Do you recall the Chairman making a comment like that?

10 A. Yes, and I agreed.

Q. I think what you indicated, in fairness, is that there was a lack of resources at the moment and therefore there might be a problem dealing with that situation.

A. Yes.

15 Q. Is that a fair reprise of your answer?

A. Yes, I did.

20 Q. What I am interested in knowing is this, given the fact that you say you wouldn't have the resources to meet with that problem, are there others within the branch who could do that type of work? For example, could you tell the Chairman what the resources section is and what they do, and whether or not they might be in a position to respond to a particular question on a particular day?

25 A. You are quite right in saying that there are other sections in the branch, as well as there are other branches in the division whose duties and responsibilities are more towards research than my own service. So the resources section, for that matter, in our branch have...I would again say not adequate staff, but have the staff that perhaps would pick up something like this and provide us with some more information, or do the research.

30 Q. Is it conceivable that on a particular problem, if a particular problem were to appear on a particular day, that



Q. (cont'd.) the study of that problem and the search for solutions might be contracted outside the government? Has that ever happened?

A. Yes.

Q. Now, Miss Jolley referred you to...

DR. DUPRE: Were you going to just leave that question of work load and go on? Were you going on to something else?

MR. LEDERER: Yes, sir.

DR. DUPRE: If I could just...thank you for raising my concerns again, counsel...could I ask you this? There is still one other way to skin the cat. You mentioned that at the moment you have got a backlog of six to eight weeks for some of the lower priority items, as I would take it, delaying them six to eight weeks.

Do you have it within your authority if, on Wednesday morning you come to the office and say well, yes, there is matter X, I really would like to devote some branch time and to look into that, and so I'm going to let my six to eight weeks backlog go to nine, ten or eleven weeks? Is this a judgement call that you are in a position to make as chief of the branch?

THE WITNESS: No.

DR. DUPRE: You would have to consult upstairs?

THE WITNESS: Yes, and frankly, my main function of my service is to provide service.

DR. DUPRE: That puts the ball just where I wanted to have it in my sight. So you would very definitely have to seek high up...I might as well ask, how high up? Will the director of the branch do? Or are you off to a higher level than that?

THE WITNESS: No, the director of the branch can do certain things, but, yes, I don't have to go any further.



DR. DUPRE: Fine. Thank you very much.  
Please proceed, counsel.

5 MR. LEDERER: Thank you, Mr. Chairman. You said  
at the outset that I was batting cleanup. It strikes me that  
I'm much more concerned about my average than I am where I bat,  
and since I got two out of three on that one I guess I'm doing  
all right.

DR. DUPRE: Very good, counsel.

10 MR. LEDERER: Q. I would like to refer you to  
one of the documents that Miss Jolley referred you to. I'm  
sorry, I think it now has a specific exhibit number and I won't  
be able to give it to you. It's the original report that she  
referred to, it contains just a cover page and then the fourth  
15 page of the report. It's a report dated June 20th, 1974...

MISS JOLLEY: Tab fourteen.

MR. LEDERER: Q. It would now show as tab fourteen,  
I'm told, of exhibit fifty-eight.

20 There is a reference here to a memo which talks  
about a recommendation of a standard or a guideline or a something,  
of one fiber per cc for asbestos. Was that ever approved as a  
standard or a guideline? Did it ever receive ministerial...let  
me rephrase that. No, let me leave it the way it is. Did it  
ever receive ministerial approval of any kind? To stand as  
anything? Or is it just one man's opinion, apparent opinion,  
25 given the fact that it is frankly a hearsay comment in the first  
place?

THE WITNESS: A. It's very difficult for me to  
comment whether it got any ministerial approval. Obviously we  
were in the Ministry of Health at that time. It needed very  
little approval of anyone.

30 It is at least two men's opinion, if I quoted  
Hugh Nelson, and myself. But you are very correct in saying





A. (cont'd.) that it didn't go beyond those two people.

5 Q. That's really the answer that I expected you to give me. Thank you, sir.

Now, the Chairman referred you to the second paragraph under number six, where you say:

"I find it very strange..."

A. Where are you now? Excuse me.

10 Q. We are still on page four of the same document.

A. I'm very sorry.

Q. And we were talking about those paragraphs which appear following the number six, towards the bottom of the page.

15 A. Mmm-hmm.

Q. Now, the Chairman referred you to the second of the three paragraphs under that number:

"The union, in their letter, have talked about our new TLV of two fibers per cc, and indicated that the company has had no knowledge of this TLV. I find it very strange, as my last report dated April 5, 1973, mentions the TLV of two fibers cc several time."

Do you see that?

20 A. Yes.

25 Q. Now, the Chairman asked you a question about why it is that you were surprised, and what I think he suggested to you is that you would be surprised because you would have expected this report to be sent to the company?

A. Yes.

30 Q. And you agreed with that. Now, I'm going to be very frank with you. My problem with the question, sir, and



5 Q. (cont'd.) the way that it was phrased, and the answer, is that it implies the reason why it was that a company seemingly didn't know. Now, are you in any position to say whether or not this report was sent to the company, that preceeding report of April 5, 1973?

A. For sure I would not be able to say, but in the practice that was followed at that time, I should be reasonably sure that it went to the company.

10 Q. So as far as you know...from what you are saying, since you can't actually know, it's more likely in your view, knowing the practice as you do, that it went to the company, rather than it didn't, and if there was some problem, it was with some other aspect of this matter?

15 A. Yes.

Q. Thank you.

DR. DUPRE: To put it in the terminology of public administration, Mr. Rajhans, can I take it that it would have been standard operating procedure for that report to have been forwarded to the company?

20 THE WITNESS: Yes.

DR. DUPRE: And that it was from your knowledge of standard operating procedure that you would have been led to conclude that you would be surprised if the company did not have it?

THE WITNESS: Yes.

25 MR. LEDERER: Thank you, sir.

MR. LEDERER: Q. Now, I have one problem of terminology, and that is when Mr. Laskin was asking questions, he was asking you about the reason for the selection of a forty-hour TWA, which I understand to mean time-weighted average, in reference to an eight hour TWA, which I also understand to mean eight hour time-weighted average. Do you recall that series of questions from Mr. Laskin?

30



THE WITNESS: A. Oh, yes.

5 Q. Okay. Now, when Miss Jolley asked you questions, she started asking you about forty-hour work weeks, and you responded with the same phrase, forty-hour work weeks.

Now, can you tell me, is a forty-hour time-weighted average the same as a forty-hour work week?

10 A. Not necessarily so, but the way the regulation is phrased - and I don't recall the exact wording, I don't have a copy - but it talks about forty-hour work week, all right? I have to look that up.

I think it does talk about forty-hour work week. Am I right there? Somebody has to help me, because I don't know...

15 Q. Sorry. What speaks of a forty-hour work week?

A. The schedule of the regulations, lead regulation and mercury regulation, talks about forty-hour work week.

20 Q. Unfortunately, I don't have that in front of me, but let's assume for the moment...

A. Yes, it should be on the schedule right at the back. That forty hour, that's what I really meant was a forty-hour work week.

Q. I beg your pardon? I'm sorry?

A. That is what I really meant by forty hour.

25 Q. So when you talk about a forty-hour work week, we are not talking about a particular plant or a particular worker who happens to work a forty-hour work week. We are talking about a time-weighted average, which is an assessment of an exposure over an average period of time?

A. Yes.

30 Q. And there is no assessment of that in relation to forty-eight hour work weeks or forty-hour work weeks...





A. No.

5 Q. ...in terms of the time a worker spends on the job, in fact?

A. No.

Q. Okay. Thank you.

10 Now, can we go to...and again I apologize, I guess I'm not too good at keeping exhibit numbers...to I think maybe the third document, or maybe the second, that Miss Jolley referred you to. This is the document dated December 10, 1974, which would be the second document, and it's the one that referred to Mr. Morton, and you may recall there were some questions about Mr. Morton's role in all of this.

Do you have that in front of you?

15 A. Yes.

Q. All right. I want, if I may, to refer you to two paragraphs. Firstly, to paragraph three, which Miss Jolley referred you to...and perhaps, Mr. Chairman, it would be best if I simply read this into the record, it's quite short.

DR. DUPRE: Indeed.

20 Q. "The threshold limit value listed by the ACGIH was based on a forty-hour work week. However, at this plant the average work week is forty-eight hours, with some men working longer shifts than that. The TLV's, therefore, should be corrected for this factor".

25 A question was asked as to whether or not, eight years ago, this correction was made. My question is, if you were confronted with this problem today, would you make that correction?

30 A. No. The correction really would not be required the way the regulation is there. The regulation says, if you read the schedule, "the average concentration of



5 A. (cont'd.) "so-and-so to which a worker is exposed shall be determined from, taken as being representative of the exposure of the worker to so-and-so during work operations."

10 So, the forty-hour work week, whatever it is estimated to be, a forty-hour work period, let's put it this way, whatever it is estimated to be, his exposure, that is what will be calculated and counted or reported.

15 Q. First of all, I'm not sure whether you would do that today. That regulation isn't in place at the moment, am I right?

A. The schedule for lead and mercury is. So the philosophy isn't going to change.

20 Q. So you are applying it simply by applying it through the present applications for the lead and mercury regulations...

A. Sure.

25 Q. ...which are now in place?

A. That's right.

30 Q. Can I assume from you've said, then, that this problem, as it is discussed in paragraph three, has been dealt with by this regulation in the manner that you have described?

A. Yes.

35 Q. Can we go down to the following paragraph, paragraph four...and again, if I remember correctly, this was the paragraph raised by Dr. Uffen...and again, if it would be useful, Mr. Chairman, I would appreciate the opportunity to read this into the record as well:

40 "In past surveys of this plant, impinger samples were used to assess dust exposure at each machine. Using this method, samples were taken as close as



5 Q. (cont'd.) "close as possible to the operator of the machine, but it was never possible to obtain a breathing-zone sample over an extended period of time."

10 Now, again, my problem, as I indicated by way of my comment, is that this is eight years old. What I'm curious to know is, what happens today with respect to this problem? What machinery do you have, what tools do you have to take samples, where are they taken, does this problem still exist, how is it dealt with now?

15 A. The problem does not exist, so we don't have to deal with it now because our samples are personal samples.

Q. Thank you.

15 MR. LEDERER: Mr. Chairman, if I could just have a moment?

DR. DUPRE: Surely.

MR. LEDERER: Okay, just one question, Mr. Chairman, one query would be a better word.

20 Doctor, I'm just a little unclear as to where we are. Dr. Uffen asked whether or not, or seemed to ask whether or not it was possible for new lines to be generated to compare to the slide exhibit which demonstrated the decreasing...or what Dr....sorry, what Mr. Rajhans says demonstrates the decreasing measurement of dust, I think it was, in the Johns-Manville plant. It was unclear to me as to whether you were anticipating we be provided with this other chart, because frankly it's still...

25 DR. UFFEN: We've asked for it. I'll wait to see whether I get it.

30 MR. LEDERER: Well, could I ask Dr. Rajhans, and this is my reason for raising it now, is it possible to generate that kind of line, the kind of line that Dr. Uffen has asked for?



THE WITNESS: A. That...

MR. LEDERER: Sorry to interrupt you. If I  
could just be clear, sir, if we can provide it, I will undertake  
to do so. I'm not attempting to hide anything from you in any  
way. My problem is just in how far it all went at the time it  
was raised.

MR. LEDERER: Q. Is it possible to generate  
that material?

THE WITNESS: A. I would have to be very careful  
and look in the files, what we have. If the plant closed...and  
we were told, in 1980? When was the plant closed? The A-C  
plant?

Q. I think we were told...yes, 1980, that's right.

A. So we can have...I mean, up to the time that  
the plant closed, we should have on our files the data, some  
kind of data, and we can extend this graph until that time.  
That shouldn't be difficult.

DR. DUPRE: As I understood it, Dr. Uffen's  
interest had to do with the time period, if I remember right,  
between 1968 and 1972, when you were beginning to get ready to  
phase in the membrane filter method, you were still using the  
impinger, and he was wondering if for that four year time period  
it would be possible to produce what were both the impinger,  
and therefore dust particle counts, and the membrane filter and  
therefore fiber counts.

Is that a fair layman's rendering of your....

DR. UFFEN: That's correct.

THE WITNESS: In all honesty, sir, that would  
be difficult, because those were not done as extensively and  
scientifically as they should have been. They were quite  
sporadic. We just took some samples here and some there.

DR. UFFEN: If I could just interrupt for a minute.  
In your testimony this morning, you explained to us that you





5 DR. UFFEN: (cont'd.) had done simultaneously the impinger method and the fiber count method. You also told me that you had established a conversion factor, and that it was very difficult to do.

THE WITNESS: It was difficult to establish the conversion factor. That's what I said.

10 DR. UFFEN: So somewhere in the record, whether it exists today or not, there were the simultaneous readings adequate for you to put on a graph, up to 1968 you have the impinger counts, and then you have the little dash line on the graph and from 1970 on, they were the membrane fiber counts.

15 It might help if we put that back on so I can be quite clear, so counsel won't misunderstand what I'm asking for.

If the records don't exist, that's one thing.

Can we put that overhead on, or the graph, whatever it was?

20 MR. LEDERER: I should say to you, sir, that it's very unlikely that I will understand what you are asking for. I hope Dr. Rajhans...

DR. UFFEN: Well, anybody that can read their own bank account and a graph of how much your savings have been over the years ought to be able to understand what I'm asking for.

25 Doctor, if it would make it easier, I'll come down and point out exactly where the difficulty is.

30 Up to this point, the little white circles indicates records based on the impinger count. From here on, the little squares represent the membrane fiber. That dotted line is intended to indicate that they made a change in the method of measurement on going from there to there.

The testimony was that they had the data in both



5 DR. UFFEN: (cont'd.) methods in that period, and in the light of the issues that have raised with us all last summer about the importance of the counting technique in establishing the validity of the epidemiological results, it's quite important for us to know how you tie these two different methods together.

10 MR. LEDERER: Well, first I should just make...if I haven't said this before, perhaps I better say it now, and I detect in...perhaps I'm over-responding and if I am, I apologize... I detect in what Dr. Uffen has been saying in response to my comments that there may be some suggestion that we wouldn't provide this if we could.

15 Let me make it quite clear that I have always taken it, since I have been retained to act in this matter, that my instructions are to see that this Commission gets full and complete information from the government, and nothing I have said was intended to demonstrate that we were going to do anything less than that.

20 In fact, if it's necessary I hope that Mr. Laskin would support that since I have been involved we have made every effort to be in communications with him to provide all the information that we have.

25 My reason for raising this now was not because I didn't want to provide it, but because I wanted to be sure that it could be provided and that we not leave here...or that I not leave here under the misunderstanding that you believe we could provide it, and then it would turn that we couldn't and I would have to come back here at a later day and be terribly embrassed about it all.

30 That was my only reason for raising it now. It's not to susgest in any way that if it can be done, it won't be done. If it can, it most certainly will be.



MR. LEDERER: Q. Having said that, Mr. Rajhans, I'm going to really put you in the pool, can what Dr. Uffen is asking for, can that be produced?

THE WITNESS: A. If they are still available in the file. As I said, I was trying to indicate that, that we did some and I have not looked at the file going back...I would have to go back and look at it. I'm in the same boat, really, as you are. I don't want to promise something that I cannot deliver, but if they are available, they will most certainly be delivered.

Q. Well, let me ask you this, then, with everybody here. Will you please undertake to go back and search your files and advise me, so that I may advise the Commission, as to whether or not that data is available, and if it is available in some form, whether or not you can produced the kind of information from it that Dr. Uffen has requested?

A. Sure, I will.

MR. LEDERER: All right. I think at this point that's about as far as I can take it.

DR. DUPRE: Thank you, counsel.

Dr. Uffen has already indicated to me he has no further questions, so...

MR. LEDERER: I'm sorry, Mr. Chairman, I have further questions.

DR. DUPRE: Oh, I'm sorry. I thought you were finished. Please proceed, counsel.

MR. LEDERER: Thank you.

MR. LEDERER: Q. In the course of their question, Mr. McCombie certainly, and from Miss Jolley certainly, and perhaps Mr. Starkman, although in fairness I can't remember, have referred you back in time and implied and suggested through their questions certain difficulties, if you like, issues that were





5 Q. (cont'd.) raised, inconsistencies they see, in some of the things that have happened as far back as ten and twelve, and I guess into the sixties, so that would take us back into the teens, years ago, do you recall those various questions? I'm not asking you to recall them specifically, but those general kinds of questions?

THE WITNESS: A. Yes.

10 Q. All right. Now, the Occupational Health and Safety Act has been in place since 1978. I think it was proclaimed in 1979. In fact, I see on the back here it's effective from October 1, 1979.

15 Now, I'm interested in knowing, given your long history with the issues and the questions and the matters that have been raised in the series of historical questions, and your knowledge of the Occupational Health and Safety Act, whether or not you can offer an opinion as to whether this Act is meant in some way to respond to some of those difficulties and implications and issues that have been raised about the past?

A. Yes, obviously.

20 MR. LEDERER: Thank you.

Thank you, Mr. Chairman.

DR. DUPRE: Thank you, indeed, Mr. Lederer.

As I mentioned before, Dr. Uffen has no questions, I have no questions. Mr. Laskin, did you have any final questions?

25 MR. LASKIN: Q. Was your last response to Mr. Lederer your own personal judgement or the judgement of the ministry?

30 THE WITNESS: I can only give you my own personal judgement by reviewing what I have seen enacted, and put into that Act following the Ham Commission recommendation and everything else, so I can only tell you what I think of it. It may coincide with the ministry's opinion as well.



5 MR. LASKIN: Just, then, one final question, just focussing on what you think of it and bearing in mind your own technical expertise in many of the areas on which the regulation focusses, and bearing in mind your own judgement, what is your opinion as to whether the proposed regulation will in fact work in the workplace?

THE WITNESS: Yes.

10 MR. LASKIN: Yes, what?

THE WITNESS: Yes, they will work.

MR. LASKIN: Do you have any reservations about it whatsoever?

THE WITNESS: Not at this time, no.

DR. DUPRE: Thank you, counsel.

15 Mr. Rajhns, thank you very, very much for a long, but I can assure you was a most useful session today.

THE WITNESS: Thank you.

DR. DUPRE: May I now propose that we rise until approximately five or ten minutes past five?

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THE COMMISSION RECESSED

25 THE FOREGOING WAS PREPARED  
FROM THE TAPED RECORDINGS  
OF THE INQUIRY PROCEEDINGS

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EDWINA MACHT

(REPORTER'S NOTE: See Volume 42 B for ensuing proceedings regarding Dr. Pelmear.)







